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The Academy acknowledges with gratitude the assistance received, in planning this volume, from Mr. James Parton Haney, Secretary of the National Society for the Promotion of Industrial Education, and Director of Art and Manual Training in the Public Schools of New York City (Manhattan and the Bronx). Thirteen of the topics and contributors were suggested by Mr. Haney, whose intimate knowledge of Industrial Education made his recommendations of special value.

RELATION OF INDUSTRIAL EDUCATION TO NATIONAL PROGRESS

BY DR. BOOKER T. WASHINGTON,
Principal Tuskegee Institute, Alabama.

When the history of industrial education in this country comes to be written it will be found that, directly and indirectly, the Negro has had an important part, not only in defining its aims and shaping its methods, but in advertising its importance to the world. The first industrial school of any importance in the United States was Hampton Institute, a school founded for Negroes, at Hampton, Va. At the time this school was established, in 1868, the value of industrial education in preparing primitive people for European civilization had already been perceived by certain missionaries in Africa and elsewhere. The idea of introducing it in America, for the purpose of solving the problem which was created by the sudden liberation of nearly 4,000,000 slaves, was first clearly conceived and carried into effect by General Samuel Chapman Armstrong, although this application of the idea was not even at that time entirely new.

In 1853 Frederick Douglass drew up for Harriet Beecher Stowe a plan for "an industrial college, in which shall be taught several important branches of the mechanical arts." In this paper Mr. Douglass said:

The fact is, that the colored men must learn trades; must find new employments, new modes of usefulness to society; or they must decay under the pressing wants to which their condition is rapidly bringing them. . . . We must become mechanics; we must build as well as live in houses; we must make as well as use furniture; we must construct bridges as well as pass over them, before we can properly live or be respected by our fellow-men. We need mechanics as well as ministers. We need workers in iron, clay, and leather. We have orators, authors, and other professional men, but these reach only a certain class, and get respect for our race in certain select circles. To live here as we ought, we must fasten ourselves to our countrymen through their every-day cardinal wants.

I mention this statement of Frederick Douglass because it indicates that even before the war which liberated them had made the position of the Freedman in this country a problem of national

importance, the need of industrial education for the masses of his race had been recognized by this great leader of the Negro people.

I will perhaps be able to give a clearer notion of the methods of this school at Hampton and of the significance of its work if I say something about the conditions that existed directly after the war, and the character of the schools that were established for the Freedman at that time. From the very start Hampton Institute has been, in many vital respects, different in its aims as well as in its methods from the other schools for the Freedman then established. I think it is fair to say, for instance, that the first schools and colleges for Negroes were all of them more or less dominated by the notion that they were to continue and finish the work that had been incidentally begun by the Civil War. They felt it was their mission to free the slaves. The war had brought these slaves physical freedom; the schools were to give them moral and intellectual freedom. Calhoun had said that if the time ever came when a Negro could master the intricacies of the Greek language he would admit that he had been wrong in his notions about slavery. The schools established directly after the war were eager, apparently, to take up that challenge. They wanted to prove the capacity of the Negro to study and learn everything that the white man had studied and learned.

It had been said of the Negro in slavery that he was intellectually inferior to the white man; that he was unable to learn the things that the white man had learned. To disprove this statement was to emancipate him. Consciously or unconsciously the desire to complete his emancipation, in the way I have indicated, influenced very largely the work of these other schools.

I do not wish to lessen or disparage in any way the importance of the work that was accomplished by these first Negro schools. The work was necessary. I am convinced that the most precious gift that freedom brought to the Negro, the thing that has helped him more than anything to realize that he was actually free, has been the opportunity given him to learn to read. All this, as I have said, was in the direction of emancipating the Negro; it gave him his moral and intellectual freedom; but it did not actually fit him to live in the new world which emancipation had brought him. This important task was first taken up in a practical way by industrial schools.

Let me illustrate a little farther some of the ways in which some of the schools and colleges founded directly after the war failed to prepare their students for the actual life that was before them. It was the idea of the men who founded the Negro colleges directly after the war that it was necessary and important to educate men and women to be the leaders and teachers of their race. No doubt it was important that the men and women who were to be the leaders of the race should have the very highest and best education that it was possible to give them, but there were a great many things, as we can see now, that they might have and should have learned that would have been more valuable than the little smattering of Greek and Latin that they obtained.

For instance, the men who became the political leaders of the race during the reconstruction period needed to know less the languages than they did the political history of Greece, of Rome, and of Europe. In all of these countries there had been slavery, and every state of Europe had, at some time in its history, been compelled to face the social, the political, and the economical problems that grew out of the transition of its laboring class from a condition of slavery, in some form or other, to a condition of freedom. But the Freedmen in the Negro colleges had no opportunity to study these things. They learned the outward form of the Greek and Latin language, but they learned very little of the history that was behind the language and behind the literature which they studied.

The young colored men who entered the colleges right after the war were not prepared to learn these things, even if the colleges had been prepared to teach them. They were not prepared because they knew at that time almost nothing about their own life; almost nothing about the problems which beset them on every hand. Not knowing these things they were not prepared to interpret the history and understand the significance of what they learned regarding other peoples who had passed through similar periods of transition. More pressing than all else for the masses of the Negro people directly after the war was the need of learning to work as free men for wages. As I have frequently said in my talks to the masses of my people, the Negro had been worked in slavery for two hundred and fifty years; it was necessary that he should learn to work in freedom. It has taken some time for the masses of the Negro peo-

ple to learn among other things, the necessity of saving and of thrift. The idea that these things could be taught directly and specifically in school had occurred to but few people when schools were opened for Negroes.

It is difficult for anyone who has not himself had the experience to understand how strange and new the world into which freedom introduced the Negro was. The reading of books, for instance, opened all at once to him a vast number of new ideas which it was not easy for him to understand, because he could not easily connect them with the ideas with which he had been familiar in his previous life. In this new world everything seemed at first strange and even fantastic, and it was inevitable that the Negro people should for a number of years be compelled to grope about and experiment. It was necessary to touch things and handle things, in order to learn their relative values. It was inevitable, too, that under such circumstances they should frequently mistake the shadow for the substance; that they should have to learn all over again, in some cases, what things were real and what things were unreal in this new world to which they had entered. It is this condition of things which accounts for the many incongruities which you could have observed and may still sometimes observe in the life of the Negro since emancipation. One of the most pathetic sights that I ever saw was a three-hundred-dollar rosewood piano in a little country school in the black belt, where four-fifths of the people own no land and where the majority of them live in rented one-room cabins and mortgage their crops and all their household goods every year for food on which to live from one harvest to another.

All this will illustrate how important it was and is that the Negro boy and girl should be made to feel that they are dealing in school with real things. For instance, the majority of the young men who come to our school at Tuskegee have lived for fourteen or fifteen years of their life in the country districts. Their whole mental horizon has been bounded by the little country community in which they lived. They have been surrounded by a people whose traditions go no further back than slavery. Their earliest years were spent sitting on a front doorstep holding a baby in their arms while their fathers and mothers, sisters and brothers were working in the field. As soon as they were able to handle a hoe

they were then set to work in a field. Perhaps they picked up something of reading and writing during the few months that the country schools opened and they learned something of the outside from the gossip of the old people gathered around the little country church on Sunday. The books they read in school told them nothing of their own life, nothing of the people about them. To them the world of books seemed something wholly different and far removed from anything they knew in real life.

To make education a permanent healthful influence in the lives of these young men it is absolutely necessary that what they learn in the school-room should be connected with what they do in the ordinary duties of their daily life. The first and most important advantage that industrial has over any other form of education is that it definitely makes this connection between the school and life. The boy who learns about rods and furlongs and acres in the classroom learns out on the farm to measure off actual furlongs and actual acres. The boy who learns something of botany and something of plant life and something of the chemistry of the soil in school puts all he has learned into practice when he goes out to work on the soil.

Where training in the industries is carried on, as it is in most industrial schools for the Negro, in connection with the teaching of the common school branches, an effort is made to connect everything that is learned in the classroom with some form of productive labor, either in the field or in the shop. This correlation of the studies in the books with the practice in the industries has a double value. For instance, the boy who is studying about the iron industries of Pittsburg finds in the work of iron molding a practical illustration on a small scale of what is going on in a much larger scale in the great centers of that industry. At the same time the boy who is learning the iron molder's trade gets a new interest in his own work when he reads in his geography about similar industries carried on on a larger scale in a great many of these manufacturing cities. The knowledge that he is a part of a great and important industry gives a new dignity to the trade in which he is engaged, and gives him both a more intimate and a wider view of the industrial life of which he is preparing to make himself a part.

Industrial education sprang up in this country to meet a

national crisis brought about, as I have explained, by the liberation of the Negro slaves. It has had, and must in my opinion continue to have, for some time an important part in the industrial progress of the South. While the Negro was not allowed during slavery to learn to read, he was taught to labor. At the close of the war the Negro had a practical monopoly of the common and skilled labor in the Southern states. To a very large extent the economic progress of the South has been and still is dependent upon the degree to which the Negro preserves in freedom that skill in the trades which he learned in slavery. Not only must the Negro laborer preserve and hand down to his children the traditions of what he had already learned, but he must be encouraged constantly to improve and fit himself for the more difficult tasks of a more complicated civilization. The opportunity for learning a trade which the Negro had in slavery no longer existed after the war. There was and is a great danger that the younger generation of Negro men and women may grow up not only ignorant of the trades which their fathers and mothers knew, but despising them. I consider one of the most important achievements of the industrial schools to be the work they have done in teaching the masses of the Negro people the dignity of labor with the hands.

All the teaching of slavery tended to make the Negro regard labor with the hand as a curse. When freedom came his first notion was that he was to cease, to a very large extent, to work. It has been necessary to teach the masses of the Negro people in the South that freedom means harder, more earnest, and more persistent labor than they ever knew in slavery. In teaching this the industrial schools in the South have contributed directly and indirectly a great deal more than can be actually measured to the industrial progress of the Southern States and, in this way, to the progress of the nation.

In his report upon the conditions of the South made directly after the war the late Carl Shurz said that conditions in the South, as far as concerned the social and the legal status of the Negro, would either tend downward, until the Negro was in a position very close to that of the former slave, or they would tend upward, until the Negro became a full-fledged, independent citizen. I think anyone who has observed the course of events in the Southern states since the war has seen both tendencies at work there. In this

connection I would lay less stress upon the disfranchisement laws than upon certain other, as they seem to me, more fundamental things.

For instance, there have been in recent years complaints from some parts of the country that Negroes would not work. It has been said that frequently when Negro laborers were given higher wages they were inclined to work less regularly than when they were given lower wages. Where such conditions have existed there has been frequently a tendency, either by force of law or by custom, to bind the Negro in some way to the soil. For example, a very large proportion of the Negro tenant farmers are dependent upon the man upon whose plantation they are employed for provisions to carry them through the season until the cotton is sold. When there comes a bad season they are not able, as they say, to "pay out." In many parts of the country there is a tacit understanding among plantation owners that they will not accept a tenant who is in debt, for the reason that the tenant's labor is often the only security he can give for the payment of the debt. If a tenant in such a case wishes to remove from one plantation to another he has to get some one "to buy him out of debt." Usually this person is the owner of the plantation to which he intends to remove. In such cases there is a mutual understanding that the tenant must remain on the plantation until the money advanced him is entirely paid. The effect of this is to reduce him to a position that is so near peonage that it is difficult to draw the line between the two. This is the tendency downward to which I have referred.

It is perhaps natural enough that such a condition as I have described should arise. It was hardly to be expected that the South should make the transition from slave labor to free labor in a single step. It is not possible to effect a revolution in men's thoughts and actions by a mere stroke of the pen. It took Europe a thousand years to pass from the slavery of Rome to the era of free labor of modern Europe. The intervening period was occupied by a modified form of slavery which was called serfdom. The condition of the Negro I have described as existing in some parts of the South today is similar in many respects to the condition of serfdom in certain parts of Europe a hundred years ago. Not only is the situation of the Negro farmers in some respects like that of the European peasant before he had broken off the restrictions and

restraints of serfdom, but the two things have come into existence as a result of similar causes and in much the same manner.

Should the condition of incipient peonage I have described become permanent in the South it would, in my opinion, put back the economic development of the Southern states for an indefinite length of time.

The movement begun by the Negro industrial schools has done much to remove the danger that these conditions may become permanent. Industrial education has not succeeded, until recent years, in teaching and improving the laborer on the plantation to any great extent, but it has done much to stimulate the buying of land by Negro farmers, and in this way has indirectly touched and inspired the tenant farmer with desire and ambition. It is undoubtedly true that the next census in 1910 will show a much larger increase in the amount of land owned by Negroes than in any previous ten years' period. But in 1890, when the last census was taken, the Negro farmers owned, almost wholly in the Southern states, 14,964,214 acres of land—an area nearly as large as Holland and Belgium combined—and this was 35.8 of all the land operated by colored farmers. This represents the movement upward to which I have referred.

During the last three years there has been introduced in some of the Southern states what are known as "demonstration farms." These farms are carried on under the direction of the Agricultural Department at Washington, D. C., but they are supported by funds from the General Education Board in New York City. By means of these "demonstration farms," the "short courses" in agriculture, farmers' institutes and other devices of what are sometimes called "agricultural extension" work, the benefits of industrial education are now being extended to the man on the soil. If this work can be continued and extended, I look for greater changes in the next ten years than in the past.

I have written at some length concerning the relation of industrial education to the Negro not merely because that is a subject that I know most about, but because I do not know where else the far-reaching effects of industrial education are so open to observation and study. Perhaps I should say, before leaving this part of the subject, that it seems to me, in the effort to solve the Negro problem by means of industrial education, we have succeeded in

working out in this country a practical and useful method of dealing with other primitive races, who are now coming for the first time into close and intimate contact with our civilization. For instance, I am convinced that industrial education will be found just as valuable in the solution of our colonial problems in Porto Rico and in the Philippines as it has been in solving some of our social and economic problems in the Southern states.

When industrial education was first started it was generally believed throughout the Southern states that it was a form of education especially adapted to the Negro. As the Negro constituted the larger portion of the laboring class, it was assumed by many persons that industrial education would teach him to be contented, to occupy a menial position, and to be forever "a hewer of wood and a drawer of water."

Great changes have taken place in public opinion since that time. The Negro no longer has a monopoly of the occupations that were once called "menial," and not only has the opposition to industrial education that formerly existed among the Negro people disappeared, but in recent years the white people of the South have become enthusiastic for exactly the same kind of education that was formerly thought fit only for the members of the Negro race. Not only in the South, but in the North, there is a growing and increasing demand for just the sort of industrial education that was once looked down upon as "degrading."

It is now pretty generally recognized that manual training does not meet the needs of the situation. Any form of schooling that merely provides discipline and culture is not sufficient. Young men and young women must from the first be taught the importance of making themselves useful to the community in which they live; they must be taught to fit themselves for some definite vocation.

It used to be thought that when a young man went to college and secured a doctor's diploma, or when he entered a trade as an apprentice, and after a course of years graduated as a journeyman, that his education, so far as his vocation was concerned, was finished. The usual program for a boy in those days was to spend some years in school learning to read, write, and cipher; then, after leaving school to spend some time learning a trade or a profession. After that his education, so far as books were concerned, was complete. This is, however, no longer true, either in the trades or in the pro-

fessions. The engineer, the brickmason, the barber, all now have learned that in order to keep up with the changes which inventions and the constant application of science to daily life are making in the trades, it is necessary for them to continue to study and to learn. Each one of the trades, just as each one of the higher professions, now has its text-books, magazines and newspapers, which any man who wishes to keep up with his trade or his profession must read and study.

To meet the demand for specially trained men in the trades a large number of correspondence and continuation schools have come into existence. Night schools have been established in many parts of the country, where young men and women may learn the trades. Most of these schools have come into existence to meet the demand for higher training of those who are already working in some one or other of the trades. Many of the large manufacturing companies have established trade schools in order to fit young men and women to perform work that requires skill and special training. All this is industrial education, and the fact that these schools have grown up to such an extent spontaneously and independently of the common school system is an indication of the extent of the need.

There is one other phase of industrial education which I should like to touch upon before I conclude this paper. In recent years I have observed that from time to time there has been considerable complaint to the effect that in the schools the moral and religious training of the pupils was not what it should be. A great many suggestions have been made as to how this fault, if it exists, may be remedied. It has long seemed to me that the ordinary training that boys and girls get in the school puts too much emphasis on the merely intellectual side of education. More than once it has happened at Tuskegee, for example, that pupils to whom we have not felt justified in granting diplomas have gone out into the world and proven by their actions that, in all the practical qualifications of life, they were better equipped than many of their other classmates whose standing was higher in the purely academic studies. Several of them have undertaken, either as teachers or leaders of their race, to perform a kind of service that was of the very highest importance. I have felt at such times that in placing as much emphasis as we did upon the merely academic training we had made

a mistake. In several such cases we have sought to rectify this error by granting diplomas to these students some years after they had permanently left school.

My experience is that the best way to keep a man from doing something bad is to set him to work doing something good. Mr. Rudyard Kipling tells a story somewhere of a little kingdom he discovered in India in which there was one unruly subject. This unruly subject, as it turned out, was a native who had some Irish blood in his veins. The ruler of this little kingdom had found this man so valuable in many ways that he did not want to part with him, but he was anxious that he should not be continually in a state of insurrection. When Kipling visited the kingdom the king, regarding him as a very wise man, put the case before him for his advice. Kipling went to see the man, and after talking with him sometime, learning something of his history and his ancestry, he went back to the king and advised him to make his insubordinate subject commander-in-chief of his army. The king took this advice, and not only was he no longer troubled by insubordination on the part of his new commander-in-chief, but perfect peace and order were maintained throughout his whole realm.

The trouble with most of our moral teaching, I fear, is that we are constantly impressing upon our pupils the importance of not doing something. Human nature is so constituted that when you tell anyone not to do a thing that is usually precisely the thing that he or she is most disposed to do.

I have always thought one reason why we have had comparatively so little difficulty in controlling the raw material that comes to us at Tuskegee is due to the fact that when they come here we set them to work. Under the direction of their teachers they plough and plant the land, milk the cows, care for the mules, saw the lumber, make the brick, and erect the buildings. All this time they are co-operating with each other, with their teachers and with the institution in the building up of the school and, in so far, actively sharing all that it represents to them and to their people. They get in this way a sense of proprietorship both in the buildings and the ideas for which the school stands. In some respects, it seems to me, that it is the most valuable part of their education.

In considering the relation of industrial education to the nation, therefore, we should not leave out a consideration of its importance

as a method of moral training. The boys and the girls who are studying to fit themselves for some definite vocation are gradually forming in their minds an ideal of life which is to direct and govern their conduct in after life. Ideals thus formed and used in the tasks of every-day life mean character in the young men and women who possess them.

THE WORK OF THE NATIONAL SOCIETY FOR THE PROMOTION OF INDUSTRIAL EDUCATION

BY CARROLL D. WRIGHT, LL.D.,¹
President Clark College, Worcester, Mass.

The National Society for the Promotion of Industrial Education was organized in November, 1906, with Dr. Henry S. Pritchett as its president. The aim of the society was to assist in focusing public opinion in favor of an educational system that would give boys and girls who enter at an early age upon industrial pursuits, an adequate preparation for industrial efficiency. As declared by the constitution of the society, its objects are, to bring to public attention the importance of industrial education as a factor in the industrial and educational development of the United States; to provide opportunities for the study and discussion of the various phases of the problem; to make available the results of experience in the field of industrial education, both in this country and abroad, and to promote the establishment of institutions for industrial training.

The dues of members were fixed at \$2.00, sustaining members at \$25.00 or more, and life members the sum of \$250.00 or more. The constitution also provided for honorary members consisting of persons who have achieved special distinction in promoting industrial education. It provided for the ordinary officers of a society, a board of managers, consisting of a president, vice-president, secretary, treasurer, and twenty-seven national members; an executive committee, consisting of the president, vice-president, secretary, treasurer, and five additional members of the board of managers, was also authorized.

The first annual convention of the society was held in Chicago, January 23, 24, 25, 1908. Dr. Pritchett declining to serve for another year on account of the pressure of business, Mr. Carroll D. Wright was chosen president; Mr. Magnus W. Alexander, vice-president; Mr. Frederic B. Pratt, treasurer, and Dr. James P. Haney, secretary. The representative character of the society is shown by

¹The writer wishes to acknowledge the receipt of information and data from Mr. M. W. Alexander and Dr. James P. Haney for the preparation of this article.

its board of managers, consisting of the officers just named and the following additional persons: Henry S. Pritchett, President Carnegie Foundation, New York; V. Everit Macy, Chairman Board of Trustees, Teachers' College, New York; Frederick P. Fish, Boston; Samuel B. Donnelly, Secretary Building Trades Arbitration Board, New York; Frederick A. Halsey, Editor "American Machinist," New York; Mrs. B. B. Munford, President Richmond Education Association, Richmond, Va.; G. Gunby Jordan, President Board of Trustees, Columbus, Ga.; Horace E. Deemer, Justice Supreme Court, Red Oak, Iowa; George N. Carman, Director Lewis Institute, Chicago, Ill.; Milton P. Higgins, President Norton Company, Worcester, Mass.; Anthony Ittner, President Anthony Ittner Brick Company, St. Louis, Mo.; John Golden, General President United Textile Workers of America, Fall River, Mass.; Charles R. Richards, Columbia University, New York; Robert A. Woods, Head Worker South End House, Boston, Mass.; Mrs. Mary Morton Kehew, President Women's Education and Industrial Union, Boston, Mass.; Charles F. Warner, Principal Technical High School, Springfield, Mass.; William H. Pfahler, President Model Heating Company, Philadelphia, Pa.; James O'Connell, President International Association of Machinists, Washington, D. C.; Charles A. Moore, President Manning, Maxwell & Moore, New York; Leslie W. Miller, Principal Pennsylvania School of Industrial Art, Philadelphia, Pa.; Miss Jane Addams, Head of Hull House, Chicago, Ill.; Frank A. Vanderlip, Vice-President National City Bank, New York; F. J. McNulty, Grand President International Brotherhood of Electrical Workers, Springfield, Ill.; Walter M. Wood, Manager of Institutional Work, Young Men's Christian Association, Chicago, Ill.; Frederick W. Sivy, President N. W. Malleable Iron Company, Milwaukee, Wis.; Louis Rouillion, Director Educational Work, Mechanics' Institute, New York; John R. Back, Superintendent F. E. Reed Company, Worcester, Mass.

On account of the different educational, industrial, and social conditions and sentiments that prevail in the various states of the Union, the methods for propaganda must of necessity vary, and obviously they should be based on a full knowledge of local conditions. The board of managers therefore at the start adopted the plan of organizing in each state a nucleus of interest from which wise and effective activity might radiate. In accordance with this

view, an effort was made to establish state committees in all states of the Union, and at the end of the first year of its existence, according to reports made at the convention at Chicago, the society had organized thirty-eight state committees composed of people leading in various lines of activity. It was the aim, as far as possible, to represent the interests of employer and employee, the educator and the people at large. And it is worthy of note that, although practically all invitations to serve on these committees were necessarily extended by letter, prominent men and women everywhere readily responded to the call. Thus, under the influence of the national society, the problem of industrial education was carried home and lodged with the representatives of the following states: Alabama, California, Colorado, Connecticut, Delaware, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maine, Maryland, Massachusetts, Michigan, Minnesota, Missouri, Montana, Nebraska, New Hampshire, New Jersey, New York, North Carolina, Ohio, Oregon, Pennsylvania, Rhode Island, South Carolina, Tennessee, Texas, Utah, Vermont, Virginia, Washington, West Virginia, and Wisconsin.

Some of the committees immediately devoted themselves to their work of arousing and crystallizing public opinion in favor of industrial education for the boys and girls of their communities. Other committees, for various reasons, remained in a somewhat latent condition, but were ready, however, to preach the gospel of practical education for efficiency whenever the opportunity might arise. Much that has been said in favor of such education in the public press and on the lecture platform, and in various articles in prominent publications, has been the direct or indirect result of the activities and influence of state committees. In several instances their endeavors have achieved concrete results. The New Jersey committee, for example, introduced in the legislature and succeeded in having passed a bill creating a state commission for the study of industrial educational needs of the state, and for such recommendations as may lead to the establishment of schools for industrial training. The influence of the Wisconsin state committee helped very materially in the incorporation of the Milwaukee School of Trades under public school auspices, and the enactment of the law which makes it possible for other cities of the state to establish public trade schools with the aid of special taxation.

The Ohio state committee made an extensive investigation of existing opportunities in the state for industrial training through apprenticeships, trade schools, and educational classes conducted by the Young Men's Christian Associations and similar bodies.

The national society, it may legitimately be claimed, has been the mainspring of the activities of the state committees, in that it assisted with the influence of the national movement in the dissemination of literature bearing on the problem, and with such other advice as it could extend through conferences, lectures, and correspondence. In order that the members of state committees might exchange more fully their experiences and their views of the common problem, thereby giving as well as receiving advice, delegates from all states were invited to meet in Chicago on January 23, 1908, the opening day of the first convention of the national society, for a discussion of methods to promote industrial education. Considering the newness of the national movement and the very unfavorable business conditions prevailing at that time throughout the country, the attendance of delegates from seventeen state committees showed clearly the general interest in the cause, and indicated that the formation of such committees by the national society was a move in the right direction.

The exchange of views from all parts of the United States was of the greatest value in establishing the policy of the national society. In this exchange two significant expressions of the meeting were embodied in two resolutions, the one calling for the appointment of a national commissioner who should devote his whole time to propaganda for industrial education and to the upbuilding and coordinating of the state organizations. The commissioner was to be ready to accept calls to any part of the country for the purpose of presenting the policies of the society and the need of some methods of organized industrial training. The second resolution recommended the conversion of the state committees into self-acting and self-supporting state branches of the national society. Such state branches might be incorporated under state laws and thus secure a more direct personal influence on the citizens of the different states.

After the adoption of these resolutions by the representatives of the state committees the society at its annual meeting endorsed them, and directed the governing board to carry them into effect. Inadequate financial resources have, however, so far stood in the

way of the appointment of a national commissioner under the above recommendation. However, the vice-president, Mr. Alexander, has, without compensation, performed the services of a national commissioner, so far as his time would permit. It is hoped that the inspiration of the next convention, which is to be held at Atlanta, Georgia, will bring the necessary support, in order that the services of a national commissioner may be secured and his work properly financed.

On the other hand, the details of the plan to convert state committees into state branches have been worked out, the work itself has been started and has advanced as far as the short space extending over the summer period would permit. The purpose of this plan is to extend still further the original policy of the society of entrusting to the men and women of a state the promotion of that kind of industrial education that a full knowledge of the social, educational, and industrial conditions and sentiments prevailing in the state would recommend, and to unite the interested people of a commonwealth for active work that must appeal to them with particular force, as it deals with the needs and well-being of their own community.

The solution of the problem of industrial education in the United States, after all, consists of the practical working out of the problem in the various communities of the country. The chief service that the national society can perform lies in its ability to stimulate individual community efforts, and to offer leadership and guidance, to the end that all state branches may work in co-operation, and that each may benefit by the advice and experience of the others. In this way the movement will emanate from many sources and spread over the country, instead of starting as a general issue with an endeavor to find practical application.

Under the plan of state branch organization the national society will ultimately have no direct membership, aside from honorary and life members, but will become a federation of state branches and the central source of information and advice for the working out of the problem of industrial education with and through the state branches. In fact, it would be the great clearing house for industrial education.

In order to carry this plan into effect the national society decided that all present and future members should be assigned to

direct membership in the respective state branches as soon as such should be formed, and that they should also be considered members at large of the national society, enjoying as such the rights and privileges of branch-general membership.

It was further agreed that the membership fee should be shared, in order that the state branch might carry on state propaganda, and the national society maintain its central organization and continue the publication of bulletins on the various phases of the problem. The state branches would, therefore, have a financial as well as technical interest in increasing their membership and in extending the influence of the society.

At the meeting on March 14, 1908, the executive committee of the national society, in carrying out the direction of the society itself, adopted a set of by-laws governing the organization of state branches. These by-laws were to serve as a model, or rather as suggestions, for the state branches. The following provisions were suggested:

First. Each state branch must have a membership of at least fifty members at all times, and its constitution and by-laws must be approved by the executive committee of the national society.

Second. Members of the state branches shall be members of the national society and entitled to the privileges of such, and all members of the national society shall be assigned to membership in their respective state branches.

Third. All membership dues shall be forwarded to the treasurer of the national society, who shall return to the state branch \$1.00 per member per year.

Fourth. Each state must hold its annual meeting in September or October of each year, so as to precede the annual meeting of the national society.

Fifth. The secretary of each state branch shall forward to the secretary of the national society a copy of the minutes of all meetings of the branch. The national secretary shall forward to all members of the state branches the publications issued by the national society.

A full and detailed constitution was adopted for the use of branches, a copy of which can be obtained at any time from the secretary of the national society. The state branches which have already been formed have accepted this proposed constitution, either in full or with slight modifications.

The first state branch was organized in Georgia as a result of a visit of the vice-president of the society to Atlanta, Columbus and Savannah, and more directly under the stimulus of the decision of

the national society to hold its second convention in Atlanta in November, 1908. Over one hundred prominent men of Georgia immediately joined the new branch, and as many more will undoubtedly be added to the list before the convention takes place, when the Georgia state branch will act as the host of the national society. Great efforts are being made by this branch to give the meeting of the national society in Georgia the importance and significance it deserves.

On the occasion of his visit to Atlanta the vice-president of the society, Mr. Alexander, attended a public meeting at Richmond, where he addressed an audience on the importance of industrial education for the development of our national resources, and explained the advantages to Virginia of a self-acting and self-supporting branch in that state. The Virginia state committee subsequently resolved itself into a state branch with thirty-six charter members.

In April last the state committee of Rhode Island held a meeting at Providence for the purpose of organizing a Rhode Island state branch, and after various addresses such a branch was formed, with many prominent people of the state as members. Alabama soon after organized a state branch with influential men in the principal cities of the state as sponsors. A branch has been formed in Iowa. The Massachusetts state committee recently converted itself into a state branch with 106 members. The state committees of New York, New Jersey, Maryland, Montana, Indiana, Pennsylvania and Texas have already made plans for the conversion of their state committees into branches, and similar action is expected of many other state committees in the near future.

The methods of organization in the Georgia, Rhode Island and Massachusetts state branches indicate the three principal plans that may be followed in forming such branches. The state committee may enlarge its membership to at least the required number of fifty and thereupon at a regular meeting resolve itself into a branch under the by-laws of the national society as above, or it may arrange a public meeting in the interest of industrial education, at the close of which the state branch may be organized, or the members of the national society residing in the state may be called to a meeting for the purpose of forming a state branch. Local conditions will determine which of these three methods shall be adopted in each particular case. The arranging of a public meeting with an appropriate

program will likely prove of the greatest efficiency in reaching the desired end, and at the same time in arousing public opinion in favor of industrial education. If the national society had had the services of a commissioner who could visit the different cities in all parts of the country it would undoubtedly have acquired a larger number of state branches.

In order that the policy of the national society may be carried out to its fullest extent, it strongly appeals to all state committees and all individual members for their support, to the end that the problem of industrial education in each state may soon be worked out by a strong and active state branch. Only as a federation of state branches will the national society be able to demonstrate its greatest value to the country.

In addition to the general aims of the national organization, as provided in the constitution, it has been declared by the executive committee, under authorization of the board of managers, that the committee interprets the objects of the society to include the promotion of education in the mechanical trades in their relation to agriculture and mining. This broadens the original scope of the society so that nearly every phase of industrial education may be considered.

The publicity work of the society is carried on through the secretary's office. The society has published six bulletins and has several others in preparation. A vast deal of work is performed in this direction by papers and magazines which have signified their desire to receive information published by the society. Such requests have come from nearly 1,000 publications.

The society is extending its influence in various ways by co-operating with other organizations. For instance, the society was represented at the meeting of the American Federation of Labor in Washington in 1907 by its then secretary, Prof. C. R. Richards, who spoke on the plans and aims of the national society. It also joined, through Messrs. Rouillion and Richards, in co-operation with the National Educational Association. The vice-president, at the invitation of the Secretary of Agriculture, conferred with various officers of the government in regard to bills pending in congress providing for national aid to the states in the matter of industrial and agricultural instruction. Dr. James P. Haney, the present secretary of the society, represented it at the Third Annual Congress on Art Edu-

ciation, which met in London in August, 1908. A committee consisting of Messrs. Pritchett, Richards and Higgins was formed to confer with a like committee of the Society for the Promotion of Engineering Education to secure co-operation and avoid duplication of work.

Upon the suggestion of the board of managers a committee of ten was appointed last spring to consider and report upon the relation of industrial training to our public school system. This committee consists of Dr. H. S. Pritchett, President Carnegie Foundation for the Advancement of Teaching, New York, Chairman; Prof. Paul Hanus, School of Pedagogy, Cambridge, Mass.; M. W. Alexander, General Electric Company, West Lynn, Mass.; President E. J. James, of the University of Illinois, Urbana, Ill.; Hon. Elmer E. Brown, Commissioner of Education, Washington, D. C.; Dr. Thomas M. Bailliet, School of Pedagogy, New York University; Prof. Leslie W. Miller, Principal School of Industrial Art, Philadelphia; Dr. Charles S. Howe, Principal Case School of Applied Science, Cleveland; Mr. L. D. Harvey, Superintendent of Schools, Menominee, Wis.; and Dr. William H. Maxwell, Superintendent of Public Schools, New York City.

Much is expected from this committee. It has broad lines on which to conduct its inquiries, and the personnel guarantees the thoroughness of the work. The matters referred to the committee were the subject of a resolution adopted by the board of managers in January, 1908, as follows:

Resolved, That a constructive study of the possibilities of industrial education under public direction should be an important phase of the society's work for the following year, and that for this purpose the following committee be appointed to report at the second annual meeting of the society:

- (a) A committee upon the problem of industrial training for boys and girls from fourteen to sixteen years of age.
- (b) A committee upon the organization of public technical high schools.
- (c) A committee upon the organization of public evening industrial schools.

Another resolution was also adopted to the effect

That the board of managers feel that one of the most serious questions facing the development of industrial education is concerned with the problem of efficient teachers, and that this problem be made a special subject of study by the executive committee during the coming year.

All these matters were referred to the committee of ten and will be carefully and fully considered by that committee.

With this outline of the work contemplated by the National Society for the Promotion of Industrial Education, it will be seen at once that its chief need, like the chief need of all such organizations, is a sufficient amount of money to carry on its work of propaganda for a few years. Probably \$25,000 a year for three years will carry its work from the national point of view to such an extent that state branches will take care of its immediate application.

Efforts are being made to secure the incorporation of the society by congress, and to that end a bill to incorporate the National Society for the Promotion of Industrial Education was introduced in the Senate of the United States by Senator Lodge May 7, 1908, and is now pending.

The society appeals through its finance committee, as represented by its treasurer, to the generosity and philanthropy of men of means, feeling thoroughly convinced that there is no direction in which money can be spent with greater expectation of good results than in the work it is doing. It is only one of the great instrumentalities making for the general uplifting of the young people of our country and enabling them to secure employment in skilled trades, rather than to idle their lives away or waste them in unskilled callings.

The society has made a splendid beginning; its first convention was gratifying from every point of view. It brought together men from all parts of the country, speakers of note and reputation along the lines relating to general industrial training. These annual conventions are national. They speak to the whole country and not to a single community, and should they in the future rise to the standard of the first much good will result.

VOCATIONAL TRAINING AND TRADE TEACHING IN THE PUBLIC SCHOOLS

BY JAMES PARTON HANEY,

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and Director of Art and Manual Training in the Public Schools
of New York City (Manhattan and the Bronx).

Certain elements of difficulty present themselves in any discussion of vocational teaching, owing to the fact that the average school officer thinks in this connection of a boy of one age, while the employer or director of a trade school thinks of a boy of a different age. The latter has no suggestion to offer as to the vocational training of the boy before the sixteenth year, while the former is most concerned as to the future of that great army of boys who pass out from the schools at the age of fourteen, whether or not they have reached the highest grammar grade.

The school officer is perturbed when he reflects on the two years which these boys must waste before they can, as apprentices, gain admission to any shop. The average trade school teacher looks with equanimity upon, and at times even commends, this state of affairs, urging that it shows the brightest boys that their advance must depend upon their obtaining more definite and valuable instruction than any they can secure through the indifferent training of the factory. Boys thus convinced of the necessity of trade teaching, and willing to make sacrifices of time and wages that they may spend a year or more in the trade school, form, in the judgment of trade teachers, those most likely to be benefited. Undoubtedly this is in large measure true, but the process is clearly a survival of the fittest, and one repugnant to every teacher genuinely interested in seeking to devise methods of instruction which will serve to promote the retention in school of as large a number of pupils as possible, to the end that each may be schooled to produce his best.


In order to clarify the general discussion, it is therefore to be premised that, as students of various ages must be considered, no one type of school will meet all requirements. Second, it is to

be noted that trade teaching as such, is not to be thought of before the age of sixteen. The uniform experience of trade school teachers as evidenced in the requirements of trade schools, both public and private, makes it plain that the boy before the age of sixteen is not wanted in any shop, and is not physically able to do the work required in a trade school. The writer, called upon recently to review the possibilities of introducing vocational teaching into the public schools of a large city system, prepared a statement from which the following matter is taken.

That which is termed "the curriculum" of the elementary school, lays its chief emphasis on subjects of general culture value. None of the studies, as presented, touches in any direct way the industrial environment of the pupil, nor do the subjects, except in certain phases of the number work, concern themselves directly with problems which appear concrete and useful to one of vocational bent. The course is one dealing much with theory, but comparatively little with practice. It places its emphasis on mental rather than on manual achievement. The pupil who is brilliant mentally, prospers and has his work commended, but the pupil who leans toward vocational work, and who lacks ability or interest in mental performance comes in for serious criticism. As a whole this system stands for a training of the thinker rather than the doer, the time given to manual performance being but a very small fraction of that given to school work as a whole.

The manual training which is now offered in elementary schools is developmental and socializing. Its purpose is a general training, not a special one. Manual training as an element of the elementary curriculum has an important rôle to play, but this rôle is not vocational in character. As a subject, this training is one to be pursued through the entire elementary course. It looks to a general schooling of the pupil in intelligence and skill, and offers its advantages alike to pupils bright and dull. It may properly prepare for further study of an industrial character, but it is not itself to be developed on vocational lines.

Vocational work, on the other hand, should be special and intensive. It should give those pupils who have a general bent toward the arts much direct training in shop methods and shop standards. Vocational training should, therefore, follow the general manual training of the elementary schools. It should rise out



of such training, and look not to general but to special development of the pupil's ability and skill. Manual training is part of a general educational system to be pursued in the early years by all; vocational training is part of a system of industrial education to be pursued by those desirous of entering the trades. The aim of the latter should be to give the pupil insight that will later enable him to make an intelligent choice of some specific vocation.

While, therefore, the manual work of the elementary schools has a distinct function to perform, there is increasing weight of evidence to show that it is not a subject of the elementary school system adapted to meet the vocational needs of its pupils. This need is not to be met by a reorganization of the manual work of the grades, but rather by changes in the system itself, in aspects in which it is inadequate to meet the demands made upon it. In the main our system as differing from that of continental Europe does not take cognizance of the probable destinies of its pupils. Based on principles assumed to be democratic, it makes no distinction of mental capacity and proclivity, but offers the same preparation to those who are to go into the professions and to those who are to enter the commercial and artisan world. That such preparation cannot be uniformly satisfactory is manifest not only from the failure of a large number of pupils to cope successfully with its requirements, but in the complaints of employers that the public school graduate is ill prepared for life as a worker and that he has by the schools rather been trained away from that life than toward it.

Large numbers of pupils leave the elementary school before completing the course. These will be found chiefly in two classes. First, those who are not mentally equipped to complete the work as at present arranged for the higher grades, and second, those with strong vocational inclination who are dissatisfied with the school's curriculum, and seek the first opportunity to enter on a vocational career. The former pupils are the so-called over-age children of the lower grades. Slower than their mates, they take as early an opportunity as possible to secure their work-papers and leave the field of their unsuccessful effort.

But once out in the industrial field the boy from fourteen to sixteen finds that he is not wanted as an apprentice or learner in any trade. He is too immature physically to meet the demands made upon the adult in the factory or the shop. If admitted it is only to

serve as errand boy or as assistant in the performance of some routine of unimportant mechanical work, but as errand boy, feeder or helper he receives practically no instruction and is paid a very trifling wage. There is a serious economic loss both to state and worker under these conditions. The boy has lost school training on the one hand and is unable to recompense himself by adequate technical instruction on the other. With such defective preparation it is not to be expected that he will develop into a workman of great value.

The recent well-known report of the Industrial Commission of the State of Massachusetts stated that 25,000 children were found to be in the vocational field between the ages of fourteen and sixteen. Most of these children were drifting about from one position to another in the endeavor to secure some permanent foothold. In the words of the compilers of the report: "For the great majority of children who leave school to enter employments at fourteen and fifteen, the first three or four years are practically waste years, so far as the productive value of the child, and so far as increasing his industry and productive efficiency are concerned. The employments upon which they enter demand so little individual skill that they are not educative in any sense."

From this statement it might be inferred that the most important part of industrial teaching dealt with pupils between the ages of fourteen and sixteen—the "waste years." In reality the question is one which should deal with the pupil before the age of fourteen, for, unless he has received some definite vocational interest and bent before he has reached the limits of his compulsory schooling, he leaves the elementary school without insight or training in any of the things which make for the successful choice and pursuit of a vocation.

While therefore trade teaching as such cannot be advocated for the immature pupils of the elementary school, *preparatory vocational training* must come to be seen as a necessary preliminary to the development of what may be termed the clientele of the trade school. The years for such training are the sixth, seventh and eighth years of the elementary school course, and the two years immediately succeeding. The first three of these are the years when the pupils are most prone to leave school, while the last two form the period when his services in the trade are as yet undesired. By

the sixth year the mental capacity and bent of the pupils may be determined. If those who lean toward vocational work can have their interests met at this stage, it may reasonably be expected that a very considerable number of them will be induced to remain in the school through the period of the usual elementary schooling, while many will in addition continue for one or more of the secondary years if these offer instruction particularly planned for the vocationally inclined.

It is believed that the condition most essential to the success of a school planned to give this vocational training will depend on its establishment as a new and separate unit in the school system, one officered by a corps of instructors especially chosen because of their vocational knowledge and specific interest in the form of instruction to be given. The school should be one planned to perform a particular service. It should offer to the pupils the definite aim of vocational preparation, beginning some time before the completion of their compulsory school period, and by the practical nature of its teaching striving to hold them after such period through the critical two years which follow. If the course of study is so organized, difficulties will be obviated, which would inevitably affect the success of a plan giving vocational training in the higher years of the elementary school, as at present organized, or in the lower years of a high school course, extended downward into the grades. In either case the vocational work would be incidental to the general curriculum, tacked on and loosely articulated with the regular course of study. The preparatory vocational school demands, on the contrary, that the vocational subjects be the center and core of its teaching. Both pupils and parents must see the school as one giving a preparation so direct and valuable to the future worker in the trades, that its graduate may count upon his knowledge as an immediate asset in securing him a shortened apprenticeship, and a speedier advance in wages.

Entrance into the preparatory vocational school should naturally be offered as an elective, that is, the school should be organized in any district in a city in which the defection in the sixth and seventh years is now most marked, and should offer its courses to those pupils only who might choose to follow its curriculum rather than that of the grades as at present arranged.

Curriculum for Vocational Schools

The curriculum of the vocational schools should require considerable training in hand work during the first year with additional emphasis on this work in the succeeding years. With this hand work there should be offered related lessons in English, geography, history, physics, arithmetic and drawing. Shop discipline and methods should form an important element in the practical work, and visits to shops in operation should be required. All of the subjects should be developed from the vocational point of view with particular emphasis on the parts they have to play in furthering the student's practical knowledge of the industrial world. While the students might be called upon for a comparatively small amount of home work, it is believed that they would profit by a school day longer than now required. In any occupation their services would be demanded at least eight hours a day. In the vocational school they might well be required to receive seven hours of instruction and practice ~~each~~ school day. So arranged and without being unduly fatiguing, the course would offer an extended and valuable training in both theory and practice. In the technical branches the teachers should be especially qualified by actual trade experience. They should be skilled workmen of high intelligence, that they might be able to hold up before their boys the best standards of the crafts.

In the first year of the proposed school the shop work should aim to familiarize the pupils with the use of woodworking tools and with the handling of simple pieces of machinery like the speed lathe. In the second year it would also be possible to offer work in metal both in the form of chipping and filing at the vise and in the working of brass at the speed lathe. The great accuracy that is required in the metal work, and its fundamental relation to many mechanical operations, would make it a highly useful method of introducing the pupil to representative forms of industrial practice. It is to be noted that all the different types of work suggested are within the physical ability of the pupils between the ages of eleven and fourteen.

In the higher years of the vocational school it would be necessary to differentiate the departments of instruction to the end that the student might elect to pursue his vocational work along the lines

of woodworking or machine shop practice, electrical work, etc. In the extended development of several of these preparatory vocational schools, it would undoubtedly be of advantage to organize each school to lead to a particular group of industries. One might prepare apprentices for the building trades, another for the metal working trades, a third for the printing trades, and so on. The satisfactory differentiation of the work in the higher grades of the vocational school is a matter only to be determined by trial and experimentation. It must, however, be carefully noted that the school proposed should not undertake to graduate pupils equipped to enter the trades in any capacity save that of an apprentice already considerably advanced in technical knowledge, and possessed of skill sufficient to enable him quickly to assimilate the particular knowledge of any specialized industry rising out of the course he has followed.

It is assumed that with this knowledge and skill the advantage of a shortened apprenticeship will be offered to the graduate. In view of the almost uniform statements of employers this belief is held justifiable. In any large city it may safely be premised that a number of employers will be found willing to accept the vocational school graduate, and to advance him more rapidly in his apprenticeship than the unskilled applicant who enters without knowledge or insight into processes and without training preparing him to adapt himself readily to the different forms of work required of the learner. The immediate co-ordination between the vocational school and employers is a necessary and purposed part of the plan proposed. It would act directly to interest a large number of practical men in the work of the schools, while it offered to the pupil the stimulus which comes from a realization that, on the completion of his course, he will be put immediately in the way of entering on his chosen vocation under conditions more favorable than could otherwise be the case.

Another important element commending a school looking only to the preparation of the apprentice for his apprenticeship, is the fact that it will not act to arouse the opposition of organized labor, which looks with suspicion on any scheme which undertakes to throw upon the labor market many young and indifferently skilled artisans whose number and whose willingness to accept employment at less than the usual wage, tend to lower the standard of living for all workmen in the trade.

Trade Teaching for Those Already in the Trade

Two types of schools would serve to give trade instruction to those already engaged as apprentices. One of these exists in the form of evening classes, as at present organized, in machine shop practice, plumbing and carpentry in the manual training high schools of various cities. Fully developed, an evening school of this kind would offer a number of different courses of a very practical nature, each planned to forward the student as rapidly as possible through operations designed to acquaint him with the use of tools and machines with which as an apprentice he would become very slowly familiar in the routine of the factory. The evening trade school should seek to shorten the apprenticeship of the worker by advancing him to a broad knowledge of the technique of his vocation. It should supplement mechanical exercises with explanations as to the reasons for each operation, the theory on which it is founded, and the material with which it deals. Emphasis is laid on the fact that students in this school should be actually at work in the trade, putting into daily practice the knowledge which they gain at night. This knowledge should be supplementary to the practical work of the shop; it cannot take the place of this work.

In connection with the above plan very valuable teaching might be done by offering, from time to time, brief courses designed to give instruction in some special feature of a single trade. These courses, properly advertised among the apprentices of that trade, would undoubtedly serve to attract a number who might be prepared to attend for a limited number of weeks, though they might not be in a position to take a more lengthy and elaborate course of instruction. It is urged that serious consideration be given to this plan for developing short evening school courses of a highly specialized nature. As a method of supplementary trade teaching it has much to commend it.

The second type of trade school designed to assist apprentices in the trade is the so-called "Partial-time school." This has been repeatedly advocated, but it is believed has not as yet been fully developed, except in the Cincinnati School of Engineering, where there are a number of students now taking a six-year course, three years of which are in the laboratories of the school and in the various shops in the city. In this school the student is required to

work alternate weeks at the university and in the machine shop. The latter pays him for his time, and the wages earned amount in six years to \$2,000.

Continuation Schools for Apprentices

In addition to direct trade teaching, "continuation instruction" should be offered to apprentices desirous of furthering their general knowledge of subjects not immediately vocational, but intimately related to their successful training as artisans. This instruction should be given in evening schools in the form of industrial mathematics, drawing, economics, etc. In pursuit of this plan it would be entirely possible to develop a continuation evening school for those in the machine trades and another for the building trades, a third for those practicing the arts, and a fourth whose work brought them into the widening field of chemistry and electricity.

Mention should also be made of the plan now in operation in Chicago of offering day continuation schooling to carpenters' apprentices for four months each winter. In a report on this Chicago day apprentice school, rendered by the principal, William J. Bogan, in 1906, it was noted that the daily average attendance for the term was 228, the average age of the pupils being nineteen years. The instruction given included work in English, arithmetic and industrial drawing. The carpenters' union exacts fines of apprentices who do not attend. The school has already had a measure of success, its most noteworthy feature appearing in the willingness on the part of the unions to aid in raising the standards of intelligence of their workmen. With further experience and the inclusion of courses that would make strong practical appeal to the apprentices, there would seem to be good ground for a belief that this day continuation school will come to occupy a permanent place in every scheme of trade teaching. An important element in the plan is the fact that the apprentices in the Chicago school are paid by their employers while in attendance.

The Day Trade School

No discussion of this subject should be closed without reference to the plan recently adopted in Milwaukee. In this city a trade school was opened in January, 1906, by the Merchants' and Manufacturers' Association. Short trade courses were organized offering

five months in plumbing and a ten-months' course in pattern-making, foundry work, machine work and toolmaking.

The minimum age of admission in the Milwaukee school is sixteen years, and the candidate must have had school training equivalent to at least eight years in the public schools. Since the opening of the school it has been incorporated into the public school system of the city, but it remains to be seen whether it can successfully be developed as a part of that system. The work it offers resembles in some respects that recommended for the last two years of the preparatory vocational school, but differs from the latter in the requirement that the pupils must have reached sixteen years of age before entrance, and in the emphasis that it places upon the intensive study of the mechanics of a single trade.

If, as observed in the case of the preparatory vocational school, this school of the trades avoids offering its graduates as completely equipped apprentices prepared to undertake journeyman's work it will escape the otherwise inevitable opposition of organized labor. If, on the other hand, its graduates do not become regular apprentices after leaving the school, but are exploited by employers in competition with the rank and file of the wage earners, then the systematic opposition of labor will be likely, in time, seriously to curtail its activities. Finally, it should be noted that, though this school develops in the most successful manner, it never can be more than the capstone of a system which should begin with pupils several years younger. Undertaking trade teaching, it properly limits the age of those who enter to sixteen years, but, as has been previously stated, the important problem of the elementary school is that which seeks a method of training pupils between the age of twelve and sixteen. It may be definitely asserted that no trade school, organized as such, can adequately solve this problem; its solution lies in the development of the preparatory vocational school.

ELEMENTARY TRADE TEACHING

BY CHARLES H. MORSE,

Secretary and Executive Officer, Massachusetts Commission on Industrial Education, Boston.

The subject of elementary trade teaching pertains to the most urgent educational need of the present time, viz., industrial education. It is fortunate that we can all agree that there are educational needs, and that our present system of education cannot, from the very nature of the case, be final, for there can be no such thing as finality in education as long as man continues to develop. We catch the cue-word of the most urgent educational need from the very age itself in which we are now living, the Industrial Age. For it is the conditions of this age which have made so plainly evident to us a great shortcoming of our present system of public education.

In reaching, perhaps I may almost say groping, after the ideal system of public education, we have, during the past three decades, successively added to our school system the kindergarten, the manual training and the commercial schools. These, with the exception of the last, have been cultural developments, and even the commercial instruction is usually treated as a "cultural" subject.

But even with these additions we still find our free school system so far from being ideal that it sends out into the world at about the age of fourteen years the great majority of its pupils without giving them any idea of life's possibilities, to say nothing of a lack of training which would enable them to enter, with some degree of preliminary preparation, upon lines of productive work. It is not generally realized how completely our present educational system shuts out and how completely our educators lose sight of, those who drop out of school between the ages of twelve and sixteen. Many of these ex-pupils enter commercial ranks, but the majority join the army of hand-workers and producers.

It is not an ideal free school system which does not guide the child who is to leave school near the upper limit of compulsory school attendance in the selection of a life work, and furnish him with some degree of preparation for entering upon that work. The

free school should at least give the future hand-workers such a preparation for life's work that they may make the most of life's opportunities.

The need of industrial schools is brought about by the demands and conditions of the present day. The youth cannot become a skilled industrial worker without a preparatory training. The old-time apprenticeship system, in which the master workman taught the youth, under his own eye, the necessary work and even the secrets of his trade, has gone by. In fact, it could not exist under the present-day industrial conditions. Still the demand for highly skilled workers has grown enormously and is on the increase. Indeed, so great is the present-day demand that the majority of the youth, at least of young men, who reach the age of self-support enter upon some form of industrial work.

Fortunately, we do not have to discuss from the beginning the propriety of making the professional training of youth a public education matter, for that question was decided in the affirmative by the introduction of commercial instruction in the public schools. If enough pupils are expected to enter upon commercial life to justify public commercial instruction, how much more do the greater number who enter upon industrial life justify industrial instruction at public expense?

It has been found, however, that separate commercial high schools are necessary to meet modern business demands, and all the more will separate industrial schools be needed to meet industrial demands, because trade processes must be taught by skilled specialists, and the general supervision which will suffice even for a commercial school will not be sufficient for an industrial school. In the establishment of industrial schools for youths we are but extending, that is, carrying down, the idea of professional training to a legitimate public education field.

It cannot be too strongly stated that the average pupil who goes to recruit the ranks of the hand-workers merely drifts along almost aimlessly, and is not guided as he should be. It is the rare exception that such a child has a definite object and ambition aroused during his school years. The cause for this state of affairs is to be found both in the home and the school. In the average home the specific future of the child is not dwelt upon, although there may be frequent references to the early time at which he must get

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to work and earn his own living and help to support the family. But no objective goal is constantly held up to the child towards which he must shape his course and concerning which he may be gradually acquiring information by observation and from periodicals and books. The average American home which sends recruits to the industrial ranks offers no opportunity for the child to obtain the necessary inspiration, encouragement and accumulation of knowledge to enable him to begin his life's work with a settled purpose "with his eyes wide open."

Even those who continue their school course after leaving the grammar school are too frequently purposeless in their aim, in fact, have no aims. In my own city, where the Latin school which prepares for college, the high school and the manual training school are all grouped, almost at the gates of Harvard University, I have known of cases where the grammar school graduate has started out from home, on the proper September morning, to begin his secondary school education, but with no idea as to which school he would attend. He finally joins a group of children likewise bound for the secondary school, and follows, perhaps, some individual with whom he may have entered into school-boy conversation, or he follows the largest group into some one of the higher schools, to him it matters not which. Thus chance determines his future education and his life's work. But the other group, the five-sixths, who leave school at or about the close of the grammar school years, is the one that deserves special consideration, and it is this class to which the independent industrial schools will appeal.

First the question comes up, "What can the teachers in the elementary public schools do to promote a more satisfactory condition in those schools?" There can be no doubt that more and more it is devolving on the teachers in the lower grades to counsel and guide pupils regarding their life work: and to meet this will require broader views, broader methods and broader sympathies than are found to-day among the rank and file of our teachers. This means that better pay must be provided to attract to the teaching profession men and women of the highest qualifications in both social and mental training; and that a preparation for their profession shall be given them that shall enable them to cope successfully with the practical problems that they must meet. In the selection of a teacher, the environment in which he has been brought up, his views

and tastes, in other words, his personality, must be given as much weight as his intellectual attainments in prescribed lines.

There are needed teachers of warm sympathies and enthusiasms who have sufficient interest to keep in touch with those of their former pupils who have of necessity or choice gone out into the world to begin the doing of their life work. We must take it for granted that those remaining in school and passing on to higher grades are properly looked after. The slight extent to which teachers follow out into the world the pupils who spend their last school year with them is truly lamentable. It is astonishing to find in how few instances even cold and formal statistical records are kept by the schools regarding those pupils who have gone out from the schools.

There should be no real industrial education, as I understand the term, undertaken before the child is fourteen years of age. This means a beginning at about the end of the ninth school year. For nearly two years the term "industrial education" has been used by the Massachusetts Commission on Industrial Education to mean trade education. But this does not mean a trade education as understood by some to signify the instruction given in a school which teaches a degree of manipulative skill in the shortest possible time without regard to a thorough preparation for a trade. In the majority of cases in this country manual training courses are given by men or women who have never learned a trade of any kind, and they deny with much feeling that their courses should be treated as other than (cultural). Manual training should be given in all the school grades from the kindergarten up. But do not let us deceive ourselves. Such courses are no more industrial courses than the penmanship courses or the drawing courses now given in our elementary schools are industrial courses.

If I must plan a course that will ultimately lead to a trade, beginning with boys at twelve who are residents of a city, the course for the first two years would not materially differ from the work which would be given in a well-conducted grammar school for children of the same age. But I would have the child of that age study in connection with other subjects the manufacturing establishments of the community. He should know their business organization and general methods of management, their history, the sources of the raw material used, the geography of the regions from which

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the raw materials come, the transportation facilities and in a general way, the various processes of manufacture. The markets for the finished product should be studied; also the special qualifications required of the employees, the wages for beginners, the average increase of wages and the possibilities for advancement for an earnest, intelligent worker, as well as the hours of work and the steadiness of employment for each industry.

All this would be given as work in English, geography and history. These investigations of industries should be conducted under the guidance of a teacher who could understand the bearing of such a study upon the boy's mind. All of this work should be included in every grammar school course. If such studies could be carried on under a broad-minded and well-equipped teacher, the boy's point of view would be quite different from that of the fourteen-year-old boy as educated to-day, and he would be prepared to choose an occupation more wisely. I look upon such study not as industrial education, however, but as a line of general education of value to every boy and girl in school. The grammar schools would thus perform a valuable service to those pupils who expect to enter trades, or who leave school at an early age, by directing their attention to local industries.

I will select a textile mill town as an example of what may be done by the public schools to assist pupils to inform themselves regarding the work of the chief industry of the town, and to study it with interest. The teachers should be urged to study local conditions; they should study the mills and the textile industries of their own town and become familiar with their history. Textile museums should be established in the public schools of the textile city, stories should be written on technical subjects relating to textile manufacture, the history of weaving should be taught and a study made of the fibers used in the manufacture of textile goods. As a result of this study of the textile fabrics, written material should be accumulated, which might later be developed into a book to be used in the public schools of the town. The co-operation of manufacturers should be secured by asking the use of their files of textile journals and such technical books on the industry as they have available in their offices. The co-operation of the public libraries in the purchase of books dealing with textile questions should also be obtained. I would suggest, also, that a teacher be detailed, on a leave of absence

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from teaching duties for a short time, to prepare a pamphlet on the industry of the town, including the method of textile manufacture as carried on there. Such a general plan, carried out in various cities in which special industries predominate, would stimulate the interest of the boys in local industries. It would be of the greatest value to the communities and to the state.

A year ago I visited a school in Cork, Ireland, which I wish might be seen by every American teacher. Each class-room was completely surrounded by cases with glass doors, containing Irish manufactures in every stage from the raw materials to the finished article. And yet the school was not a trade school. In our present school system we assume that what is proper in the way of training for the boy who is going to college, is proper for the boy who is going into industrial work. The result is that the very large number who must go to work when they become fourteen to sixteen years of age have been educated away from the trades rather than toward them.

Only a generation or two ago the majority of the boys in the Commonwealth of Massachusetts were brought up on the farms. These boys had an opportunity to do with their hands; they did all kinds of farm work; in many instances they repaired the buildings and the kitchen utensils, the stoves and the farm machinery; they had a vocational training at home. The majority of boys in the Commonwealth of Massachusetts to-day are in the cities, and they have not an opportunity equal to that of the boys just mentioned. Everything is done for the boy, and he is not trained to do things for himself. He has not that opportunity for development which was given our youth of Massachusetts but a short time ago.

I have been discussing the boys. Let it not be thought that I have forgotten the girls. Among the women of Massachusetts, for example, not so many years ago, the mother spun and wove; she made the candles; she made the soap; and she did everything about the household. She had a training which was a superior training, and superior women were developed. We are told to-day that in the cities a majority of the people do not cook their own food; it is bought at the bakeshop, and the girls in the majority of instances in the large cities have no opportunity to learn anything in the way of home industry. What is true of Massachusetts is true of the other more thickly settled sections of the country.

If it is a fact that there is no opportunity for the boy to learn a trade in the shop, and the opportunity to learn home-making, domestic science in its best sense, does not exist for the girl, then is it not the duty of the country to provide for that education in the free schools? I think there are opportunities in our schools for the girls to have some training in planning the expenditure of money. Of course, a large percentage of those girls are later to become the heads of families and are the ones to have the expenditure of the money which the boy we are attempting to prepare to make his way in the world will earn for the support of the family. It is the wife and the mother who does the spending of the money, and she should be trained to expend it wisely. She will then be the better able to help develop the highest type of home for the families of our mechanics.

But let us return to the boy. If he goes out to attempt to learn a trade at fourteen years of age, the manufacturer says, "I do not want you in my factory," and he will not employ him except in a position where he is simply an errand boy, and even in those places many of the manufacturers say they do not want the boy. You ask me how I know it. Agents of the Massachusetts Commission on Industrial Education canvassed the state recently; they interviewed a large number of our manufacturers in the skilled industries, and out of some 1,000 men interviewed who employ thousands upon thousands of other men in the great manufacturing establishments of the state, there were very few who did not say, "We do not want the fourteen-year-old boy; he is in the way; he gets on our nerves."

We know how to sympathize with those men. We know what the fourteen-year-old boy is. We know that he is a good deal of an animal, he is irresponsible in many ways, very largely through the fault of the home, but the school must take part of this responsibility. Now the boy between the age of fourteen and sixteen, when he is not wanted in the industries, ought to be in school. The school that I have in mind is a school where the foundations of the trade can be laid for him better than they can be laid in the factory.

The boy would be given courses in woodworking and ironworking for one-half of each school day. This should be supplemented with other subjects, including drawing, arithmetic, simple bookkeeping, industrial geography and industrial history, as well as a continued study of local industries. At the sixteenth year such a boy

would be ready to study his chosen trade with a foundation for that trade which could not be obtained in any shop in our American industries. These last two years would be taken either in a school, under shop conditions, one-half of the time in the class-room and one-half in the school shop, or by a combination of part-time in the school and part-time in a commercial shop. In the former case, the boy should remain in the school eleven months of the year, eight hours per day, except Saturday, when the school should close at noon. There should be no protracted vacations except that during the month of August. One-half of the time should be given to shop-work, and the balance to the study of such subjects as have a bearing on the chosen trade, such as its history, drawing, mathematics, chemistry and physics; and, in addition to these, citizenship should be studied.

Under the part-time system the boy would take these latter courses along with work in a commercial shop, by working in the industry for a week, for example, and then attending the industrial school for a week. Thus the theory and practice of the trade would go hand in hand and the boy would also be helping to support himself and his family. By such a system of trade education our boys would ultimately contribute more largely towards the prosperity of our country than is possible at present. Such courses of instruction are proving eminently satisfactory in numerous European countries, and the graduates of such schools are in demand after a shortened apprenticeship and are receiving the prevailing highest wages.

The problem for the boys who will carry on our farms is somewhat different from that just stated for the boys who intend entering the manufacturing industries. That they should be given preparation for their life's work in an agricultural school and not in a high school with some agricultural courses attached, I have no doubt. Early last spring the farmers of Massachusetts, through the state grange, appeared at the State House in opposition to a bill providing for agricultural and industrial courses in the existing high schools. Many of the superintendents of the state argued in favor of the bill. The farmers said most emphatically, "This is not what we want." They said, "Give us *independent agricultural schools*."

We would all agree that some instruction in mechanical trades should be made a part of the work of an agricultural school. Much farm machinery must be cared for by these boys, and farm carpentry

should not be neglected. In these independent agricultural schools the girls should take many of the agricultural courses, together with domestic science and home dressmaking and millinery. The school should be planned as a finishing school for the future farmers, but provision should be made for those who can continue their education. Such schools should fit the boys for the State Agricultural College, and both the boys and the girls for the State Normal School.

For the city girl who must begin at an early date to earn her living the problem is most difficult. We are informed by those who have made a study of this question that the average time a girl remains in productive industry is about five years. The question of educating a girl, therefore, for the industry in which she is likely to remain for so short a time must be considered as a distinct problem. These girls are destined, in the large majority of cases, to become the wives of our mechanics and the mothers of the coming generation of city dwellers. I can but feel that the school training of these girls to earn their own living for about five years should be accompanied by a large share of instruction which will fit them for the work of homemaking which they are to pursue for the forty additional years of life. Certainly, the choice of all would be to retain in school for a much longer time those girls who now leave at about fourteen years of age, and give them a thorough preparation for homemaking as well as for a trade corresponding in thoroughness to that suggested for the boys, and I sincerely hope the problems may be worked out which will make this the ultimate aim of the girl's continuation school.

There is danger, however, in the working out of these problems that educators may rush blindly into this new field and that the new education thus organized will not be as effective as the old. The public demands changes, and the existing school authorities are making changes in an effort to meet this demand with no clear conception of the effect of these changes in the school courses. The public must be patient and allow those at work upon this problem reasonable time in which to prepare plans for a well-balanced public school education which will meet the needs of all.

THE SECONDARY INDUSTRIAL SCHOOL OF COLUMBUS, GEORGIA

BY CARLETON B. GIBSON,
Superintendent of Schools of Columbus, Georgia.

New types of schools spring up in response to the demands of a people. They are not often the creation of leaders in advance of their times, nor do they come as fads and fancies from the brain of an educational dreamer. In this respect they are not unlike all other institutions created by the people.

The Secondary Industrial School of Columbus, Georgia, was established in response to the demand of the people for a more practical and useful education. The demand may not be expressed in definite terms by the lawmakers or by the press. It is usually indicated by express dissatisfaction with existing types of educational work, and suggestions that something more practical and useful to young people and to society be given in the schools. It only remains for some thoughtful educator to interpret the complaints and demands of the people and formulate plans which will more directly meet their wishes.

The fundamental principle of education upon which the Secondary Industrial School was established may be expressed in these words: The dominant life of the people should influence the schemes for the education of the youth.

This is not a newly-discovered principle in education. It has always existed and has always influenced nations in the training of their young. In ancient Greece the young were skilled in athletics because the athlete was the ideal in society. When the dominant interest of the Romans was conquest through arms, a soldier's training became the chief schooling of the boy. Ever since the ancient empires of the Orient regarded as their dominant interests the traditions of their forefathers, history, philosophy and religion have been the chief means by which the young were educated. When in western Europe there was the new birth of learning, a study of the classics dominated the schools. When the spirit of

invention and research sprang up, scientific studies began to form the framework of curricula.

As the American people are beginning to regard industrialism in a broad and high sense of the term as the dominant interest, industrial training in the schools of the land follows as a necessary consequence.

During the past quarter of a century individuals and societies, recognizing the value of such training, have established schools of hand craft, manual training, technical education and trades. Larger organizations, such as city school systems, moved more slowly, but they for years have been moving none the less surely towards the establishment of industrial and trade schools.

The first industrial or trade school to be established in connection with a public school system is that in Columbus, Georgia, known as the Secondary Industrial School. It is quite natural that one of the smaller cities should have led in this movement, and in no city of America were the conditions more favorable than those in Columbus. It is a city of about 25,000 inhabitants. Its location at the head of navigation and at the foot of immense water power on the Chattahoochee River has made it a manufacturing center. The dominant life of the people is therefore that of industry, and industrial training naturally came to be one of the important means used in educating the children.

Its twelve cotton mills, aggregating more than 200,000 spindles, make it one of the important cotton mill centers of the South. It has also extensive iron-working establishments and woodworking industries, carriage, wagon and clothing factories. For more than a decade its elementary schools have done more than the usual amount of work in manual training, handicrafts, and domestic science. The city has likewise maintained free kindergartens. Several years ago it undertook to specialize somewhat its efforts in educational work, and adapted certain schools to the particular needs of certain classes of people.

For illustration, it established the Primary Industrial School for the children of mill operatives, who, in the absence of compulsory education laws and because of peculiar home conditions, could not be reached by the elementary schools of the city system. Handicrafts were made the basis of work in this school and through them motives were found for the mastery of the elementary school

branches. The school did much settlement work and sought through the children to bring about better conditions in the homes of the working people. Its contribution to industrial efficiency was therefore through the improvement in the domestic life of the workers. In this respect it has accomplished great results.

Serious study has been given in Columbus to the proper education of the negro children. About one-third of the population is black. These young people after leaving school have distinct spheres of activity. Their dominant life or interest may be clearly differentiated from that of other classes. The city has liberally equipped the negro schools for practical industrial training after the fashion of the great Tuskegee Institute, but, of course, in a more elementary way. Every negro girl is given thorough training for five years in home economics, cookery, sewing, and laundering. What is of great importance also the spirit of service is engendered. Every boy is given instruction in carpentry and blacksmithing, and the industrial training for boys has this year extended to include bricklaying, shoe and harness repairing. These avenues of employment are open almost exclusively to the negro youth of the city.

Under these civic and educational conditions, the Secondary Industrial School was an easy growth. It is true that the municipality did not bear the entire expense of creating this school—indeed, it bore a small portion of it—but the school is now maintained, as are all other schools of the city, by the public funds.

The equipment represents an investment of something over \$100,000, much of which was donated by individuals and corporations interested in the creation of such an institution. The land and several thousand dollars were given by a public-spirited citizen who has an especial interest in this type of education. The school was built without any very large bequest, without the issue of bonds, and without any very unusual appropriation from the municipal government. Not in the slightest degree, however, is the school recognized as the peculiar property or interest of any individual, corporation, class or faction of the people. The entire city looks upon it as its property, as its institution, and the people are united in their belief in its usefulness and in their determination to support it generously.

The aim of the institution is to prepare the youth of Columbus and vicinity for intelligent and efficient service in industrial life.

The term "industrial life" is taken to include commercial activities as well as manufacturing interests. It is a trade school, and more; it is an academic trade school of high-school rank. This means that the essentials of a high-school course are given and a trade is taught. Under the head of essentials are included the usual high-school studies in mathematics, English, history and science. No foreign languages are taught. There has never been any intention of teaching young people a trade without giving them good academic training, for this starts a young person in life with immediate earning power, but with an earning power that is very limited. The aim is to give that culture, intelligence and mental acumen which carry the skilled mechanic or trained accountant on to unlimited earning power.

It is a school of the people, maintained by the people, and for all classes of people. It is not recognized as a school for artisans, nor a school of the leisure class seeking some fad. Within its student body are found the sons and daughters of the well-to-do, working earnestly and industrially side by side with the children of the dollar-a-day man. The people of all classes living in such industrial atmosphere have come to realize that the greatest opportunities for service to mankind, usefulness to society, and breadwinning occupations lie in industrial pursuits. Those who enter the school necessarily do so with a purpose more or less definite. The organization requires the pupil on entering to select one trade or industry, to which, in addition to the academic subjects required of all, he shall apply himself throughout the entire course. The plans followed embrace some rather unique features. The session continues throughout the year except the month of August. The hours of the school are the ordinary working hours, from eight to four with thirty minutes intermission. The traditional Saturday holiday is eliminated.

Under the supervision of the city superintendent and management of the board of trustees, the school is also supervised by an advisory board of five experts representing the leading industries and commercial interests of the city. The requirements for admission are sound bodies, fourteen years of age, and education in common school studies through the sixth grade of the elementary schools. The candidate for graduation, having completed the academic and industrial training, is required to spend at least two months in fac-

tory, shop or business establishment, without compensation, and make daily reports to the school on efficiency. Reports also come weekly from the foremen over such workers.

The unusual length of session has several advantages. First, it reduces or practically eliminates the great waste in education through loss of time in a youth's life. Second, it utilizes in an economical and business-like way the educational plant without loss of interest on the investment through idleness and disuse. Third, it gives opportunity for a young man or a young woman to concentrate his or her educational efforts into a few years. Fourth, it offers more than twice as many hours of school work per year as the ordinary school working under the traditional nine-months' session, thus enabling the student to accomplish in the three years of the course what would ordinarily be accomplished in six years. This brings him through his high and trade school training before the average boy is more than half through his high school course. The graduate is prepared for useful service, has good earning power, or training fitting him for entrance into a technological school, which, however, is not the primary aim of the school.

While the hours of the school day may seem, in the light of traditional school work, to be rather long and to work a hardship upon pupils, the interspersing of shop work, or industrial training, throughout the day, giving relief from the constant nerve tension required in the purely academic work, and the serving of a wholesome hot lunch in the school at mid-day, remove the possibility of detriment to health. This lunch is prepared under the direction of the domestic science department.

At first some pupils coming from the other schools find it a little difficult to adjust themselves to the earlier hours, but the graduates of the school never find any difficulty in adjusting themselves, the morning after graduation, to working hours. One of the most admirable features of the whole school is the splendid spirit of interest, activity, and sympathetic industry manifested throughout the faculty and student body. All are wholesome, alive, energetic and ready for anything that comes up for the good of the school.

The advisory board, made up of persons generally recognized in the community as leaders in the several industries and commercial activities, not only serve to keep the industrial work of the school

of a thoroughly practical nature, but also to link the school closely to the industrial establishments of the community. It is to be noticed that the State of New York has embodied this feature in its recent law providing for trade schools.

The requirements for admission in age and scholastic advancement seem to have met with favor on the part of those who have later taken up the organization of trade and industrial schools. Fourteen is quite early enough for a boy to start upon his trade training, for he then comes out into industrial life at a minimum age of seventeen. The average age is somewhat above this, and yet, if the age is put much above fourteen, many are lost entirely to all such school training.

It is the aim at all times to be closely in touch with the actual industrial occupations. In the shops nothing is produced for the scrap pile. All work is carefully done from the student's drawings and usually from his own blue prints. Every product has an economic value which cannot be divorced from the educational value of the process. The products are the property of the school, and if sold, the fund is converted into raw material to be used by the boy in producing other products of economic value while developing boys who are to become economic units. Excursions are made to shops and industrial establishments for observation and discussion, but always with a view to making the next product more valuable or the manipulation of the machine more effective.

The student having completed the course of academic and industrial training laid down in the school requirements, is placed, by the school or an advisory board member, in some position for which he has fitted himself. Without pay he conforms to all the requirements of the establishment, thus giving his real efficiency a practical test. Falling into the working hours of the institution, whether it be a cotton mill or a bank, he touches elbows with his fellow workers and gets an insight into the human side of industrial life that no school can give him. He sends to the head of his school department daily reports on punctuality in attendance, persistence throughout the day, promptness in executing tasks, readiness in interpreting drawings and orders, relationship to fellow workers, and the nature and amount of work done.

Thus far the school has had no difficulty in placing its student workers, and has had the intelligent and sympathetic co-operation

of business houses and industrial establishments. This plan not only tests the pupil's real efficiency, but puts him where he may be sure of a job if he proves his worth. Coming from his overalls in the shop at the close of a day's work he may receive his diploma (in dress suit, if he please) and return to his overalls the next morning. Under the industrial ideal of this nation the typical American is the one who can wear overalls as gracefully as he wears a dress suit.

The graduation exercises of the first class to go out from the school presented some unique and interesting features, which were expressive of the aims of the school. It consisted of nine persons, three from the dressmaking department, two from the machine shop, four from the business training department. There were no orations or essays, few flowers and little music. After a plain, direct statement of the ideals of the school by one of the young men, the three young women representing the dressmaking department measured, drafted the pattern, cut, fitted and made a dress on the stage from cloth woven during the session in the textile department. After making the dress, the young ladies retired, and one of them returned, wearing the dress, and in it she received her diploma. A simple statement of the advantages of dressmaking as a bread-winning occupation, an explanation of the system of drafting, and of the processes involved in making the dress was made by one of the young ladies.

After the dress was cut, other departments of the school were represented in the graduating exercises while these girls at one end of the stage were making music with the sewing machine and plying their nimble fingers. The graduates from the business training department astonished the audience with the rapidity of their business calculations, took dictation from teacher and from citizens in the audience, and turned off good, business-like letters. A lawyer surprised them by stepping up on the stage and dictating a long legal letter, which was promptly reproduced without an error. Most of the graduates had positions the day after their graduation. All of them had good positions within less than six weeks and that, too, in the summer of 1908 famous for retrenchment in working forces.

The trades or lines of industrial training offered by the school are, for the girls, millinery, dressmaking and business training; for

the boys, carpentry, pattern-making, machinist, business training and cotton-mill work. Every course extends over three full years of forty-eight weeks each, and requires from twenty-four to thirty hours a week, in addition to academic work. This applies to business training as well as to shop work. There are no ten-week courses to turn out clerks and artisans without any academic training.

Every boy is required to take mechanical drawing throughout his course, and every girl must have thorough training in home economics. As the probability is that at least eighty per cent of the young women graduating from the school will some day have the care and management of a home, and as all of them will have more or less to do with the making of a home, considerable importance is attached to thorough training in home economics. These studies include plain, fancy and dietetic cookery, house cleaning and decoration, sanitation, marketing, planning meals, and the intelligent and economical management of a home in a broad sense. Such training of future home makers will contribute indirectly to the increased industrial efficiency of the workers who will come from these homes.

PARTIAL TIME TRADE SCHOOLS

BY PROFESSOR HERMAN SCHNEIDER,
Dean, College of Engineering, University of Cincinnati, Cincinnati, Ohio.

It is a curious fact that nearly all the trade schools have been planned for young men who desire to become machinists, wood workers, molders, bricklayers and carpenters. There is an occasional plumbers' school, and here and there a garment-workers' school. An examination of the industrial directory in the back of any city telephone book will show that there are dozens of trades just as important as the ones mentioned. It seems that no measures are being taken to operate trade schools for young men of these various trades, and indeed when the size of the problem is considered, it becomes very evident that for industrial training generally, the trade school as it is organized at present, is out of the question.

If the school children in this country under eighteen years of age, were placed in a straight line, allowing one foot of space for each child, the line would stretch from the upper end of Maine across the continent to the lower end of California. If those leaving school at or about the age of fourteen,—nearly all of them to become breadwinners,—were taken from the line, only that portion extending across the State of California would remain. In industrial centers,—and this will comprise the major portion of the Eastern states and most of the cities of the country—these children are drawn into the manufacturing and business life of the community. It is manifestly impossible to organize a system of trade schools which will take even a small number of these children, and give them in the shops of the schools the trades they seek to follow. Furthermore, since the trade school is non-productive, it would have to be supported by private endowment entirely, or a tuition fee would have to be charged. The further fact that these children leave school because of financial necessity, indicates that a very small proportion could continue in a school without some remuneration. The problem, therefore, is not to establish schools in which a few trades are taught by professional educators to a very small number

of select students, but to devise means whereby those children, who by force of necessity are compelled to go to work at an early age, may obtain further instruction, which will make them more efficient and better citizens.

Education, generally speaking, should aim to do the greatest good to the greatest number. The first object of all education is to make better citizens, and the first duty of a good citizen is to be self-supporting. The second duty is to be a good citizen in the civic sense. Consequently, for this large number, educational plans should tend to increase the industrial efficiency of the youth who has already secured a position and is working at it. It should give him such training as will insure upon his part the proper performance of his duties as a citizen of a republic.

To show more clearly the situation confronting the educator, the following figures may be cited: In the city of Cincinnati, of 8,567 pupils entering the schools in the first grade, 447 are left at the tenth grade, when the children reach the age at which the law permits them to withdraw from the school. The majority of these children enter the industrial life of the city, and thereafter they obtain no further instruction of any sort whatever, except what may be given in the night schools. They receive no instruction in industrial efficiency, and very little in good citizenship.

It is unquestionably impossible to organize under private direction a school which would deal with the education of this number of industrial workers. Investigation, however, discloses the fact that if a partial time school were arranged, a great many children could attend for part of the time if they were earning something the other part; and further, that parents would make sacrifices if the children were taught in the partial time school such subjects as would make them more highly efficient in their work, and thereby increase their earning capacities at their trades. It is evident that there is but one organized institution which can meet this situation, and that is the public school system.

The logical solution, therefore, is a broad plan of co-operation between the public schools and the industries. How such a scheme may be planned, may perhaps be best exemplified by the working of the co-operative courses in engineering now in operation at the University of Cincinnati.

These courses are so devised that students taking them work

alternate weeks in the engineering college of the university and at the manufacturing shops of the city. The classes are divided into two sections which alternate with each other, so that when one section is at the university the other is at the shop. The length of the course is six years. During the summer, students work full time at the shops, but are given several weeks' vacation; there is also a week's vacation at Christmas. The practical work at the shops is as carefully planned as the theoretical work at the university, and in all cases the students follow, as nearly as possible, the path of the machines manufactured from the raw material to the finished product sold. For instance, a student in electrical engineering spends his first year in the foundry; the next year and a half in the machine shop; the next two years in the commutator, controller, winding, erecting and testing departments; and the subsequent time in the drafting-room and sales offices. A contract is signed by the student, the university and the firm. This contract has a blank space to be filled out with the shop work the student is to receive during the six years of the course. In all cases the dean of the engineering college and the professor of electrical, mechanical or chemical engineering, as the case may be, confer with the manufacturers in planning this course of shop work, so that the students get a logically and carefully arranged shop and business training.

They are paid for this shop work on a scale of wages which begins at ten cents per hour and increases at the rate of one cent per hour every six months, making the total earnings of the course about \$1,800. Applicants for places in this course are required to enter the shops during the summer preceding their entrance to college.

The first year the course was put in operation about sixty young men came to the university to inquire concerning it. Of these, forty-five went into the shops, and when the university opened in the fall twenty-eight were left. The second year there were 800 inquiries and applications; from these, sixty were selected and sent into the shops, and when the college opened in September forty-four were recommended to us and started their university work. This year the applications and inquiries approximate two thousand.

It will be evident that this plan applied to trade education would be simply a return to the old apprentice system with something more attached, namely, definite mental instruction under trained teachers,

aiming toward industrial efficiency and good citizenship. It will be recalled that under the old apprentice system instruction was really a part of the student's training, this instruction being imparted, however, by the older men of the shop. Under present industrial conditions, this seems to be entirely out of the question. The plan, it will be noted, does not contemplate that students shall be placed in the shops by the school, but after a boy of fourteen or fifteen has obtained a position, he can, if he so desires, attend the school and receive theoretical instruction in his particular trade.

A plan similar to the above has already been started at Fitchburg, Mass. The apprentices are divided into two sections which alternate with each other, as in the engineering college of the University of Cincinnati; in this way the shops are always fully manned, and the school has always the same quota of students. The school does not attempt to teach anything concerning the practical side of the work. It aims, however, to teach the theory underlying the work, to teach the intent of the work, to give such training in mathematics and elementary sciences as will enable the apprentice to become more highly efficient, and to give such cultural subjects as will tend to make him a more intelligent civic unit. In other words, the course has in mind both the thing the apprentice is to do and the man he is to be.

It is, of course, not intended to take children from the high schools who can afford and intend to take a regular classical, scientific or commercial high school course. These courses will go on as heretofore. The plan is simply a means of aiding the greater number of children to obtain additional schooling, and of enabling them at the same time to earn enough money to pay for their simple wants.

There should certainly be no reasonable objection to this additional field of usefulness on the part of the public schools, inasmuch as the cost would be very slight and the added service of the schools to the taxpayers very appreciable. The absolute necessity for some broad, comprehensive, co-operative and thorough system whereby our industrial workers may obtain a much higher efficiency than they can get under present conditions is evident from the following facts:

The standard of living of the American workman is the highest in the world. To meet this standard he must have a much better

wage than his competitor in Europe or Japan. The efficiency of the German workman, due to continuation schools, etc., has increased to such an extent that German investigators of the United States feel warranted in considering American competition negligible. Commenting on the report of these investigators, Consul-General Mason, of Berlin, says:

Reduced to simplest terms, these investigators generally conclude that the reliance on a general and more or less superficial education, together with natural adaptability, to fit young men for almost every walk in life, and the lack of specialized study in physical science, modern languages, and the industrial arts, will, if persisted in, neutralize much of the advantage which our country enjoys through natural resources and advantageous geographical position for the South American, Mexican and Asiatic trade. They note also the enormous disparity between American and European wages, the high rates charged by express companies, and the general heavy cost of handling business in the United States, and conclude that, on the whole, the "American Danger" has been greatly exaggerated, and that a steadfast adherence by Germany to the educational system and commercial methods now in practice will leave the Fatherland little to fear in future competition with American manufactured goods. . . .

Realizing that the future prosperity of German manufacturers will depend, as now, largely on their export trade, German workmen of the better class have come to the conclusion that their best interest is to be as efficient and productive as possible. There is a new and pervading ambition to beat the foreigner wherever possible at his own game and with his own tools. When it is remembered that this highly educated, efficient and ambitious labor costs the employer only from one-third to one-half the wages that are paid in the United States and that it is comparatively tractable and easily managed, it will be seen that a situation is being developed here which our countrymen will do well to take into account.

The German workman is satisfied to work a longer period of time per day than the American workman. At the same time, it is generally conceded by American manufacturers that we are coming to a shorter working day. They also state that the efficiency of the American workman has decreased within the last ten years.

That the American manufacturer is rapidly losing ground is indicated by the following from "The Industrial Improvement Schools of Germany," by A. A. Snowden:

Take this illustration as one of many—the single item of machinery and tools. Germany's sales to the United States have doubled in the five years from 1900 to 1905. Meanwhile, American sales to Germany, in this line, are

now about one-third of the totals of five years ago. For the same period, Germany now sends to England twice as much finished products, receiving only two-thirds of the former imports. To Sweden, Denmark, Argentine and Chile, Germany now sends double the quantity of machinery and tools exported five years ago, while to China it sends five times the former amount, and to Canada four and to Portugal three times the quantity sold in 1900. In the case of all the other countries, there has been a gradual increase of trade. . . .

The new (Wuerttemberg) law—to be in full operation in 1909—compels all localities (Gemeinden) having for a period of three successive years at least forty youths under eighteen years of age engaged in industrial or commercial pursuits, to establish an industrial or commercial school, and to maintain it as long as the number of such youths employed does not fall below thirty for three years in succession. The term "commercial or industrial pursuits" is given the widest possible scope in Wuerttemberg, and takes into account not only the factory hand and the counting-house assistant, but the day laborer, the grocer's clerk, and the errand boy. The law provides for the compulsory attendance of all young workmen (a stipulation formerly left to the localities to decide, in virtue of imperial laws based on a North German ordinance of 1869). The chief objective point of the law is to furnish opportunity for instruction during the work-day,—instead of evenings, Sundays or holidays, as before. The minimum number of hours per year is to be two hundred and eighty. The schools are to be organized more strictly than ever along vocational lines, and instructors specially prepared through long courses of training are to be put in charge everywhere. The courses will extend over a term of three years, instead of two, as formerly.

These few facts demonstrate that unless a thorough system of industrial education, involving the co-operation of the school authorities and the manufacturers, is inaugurated, it will not be a question ten years from now whether we shall have an eight-hour day or not, but whether there will be any work at all for our industrial army.

PUBLIC EVENING SCHOOLS OF TRADES

BY CHARLES F. WARNER,
Principal of the Technical High School, Springfield, Mass.

In October, 1898, the City of Springfield (Massachusetts) opened the machine shop of its newly established Mechanic Arts High School for evening classes in machine tool work. The city also assumed the responsibility of continuing the plumbing classes of a private trades school which had been carried on for two years without making much progress, and was therefore ready to put its building and such of its equipment as might be used at the disposal of the public school authorities. These classes in machine tool work and plumbing formed the beginnings of the Springfield Evening School of Trades—the first trades school in the United States to be supported at public expense.

The first classes organized under this new departure were necessarily conducted on a somewhat experimental plan, but they immediately became popular with the local mechanics, and the first season proved to be very successful. Not only was the instruction promptly acknowledged to be of great value to the men who received it, but it was no less promptly seen to be of general profit to the trades represented. Before the close of the first year the Master Plumbers' Association voluntarily agreed, in employing help, to give the preference to members of the evening classes in plumbing. Leading representatives of the iron-working trades expressed approval, and advised their employees to join the machine shop classes. This early success encouraged the authorities to expand the work of the school. Classes in patternmaking and other kinds of woodwork were added at the beginning of the second session, and the enrolment in these classes, though less than that in the machine-shop work, has steadily increased. A class in mathematics for mechanics was organized at the opening of school in October, 1901, and it proved to be a valuable addition. The enrolment in this work during the years following is evidence of the growing appreciation of the value of such instruction. There are now two classes—an elementary and

an advanced class, which together cover a wide range of mathematical subjects. A lecture course in electricity and magnetism was also started in 1901, and the following year this work was extended by the addition of two laboratory classes in applied electricity, each meeting twice a week. These classes have met the popular interest in electrical subjects, and the work already accomplished justifies their continuance. In this same year (1901) the evening mechanical drawing classes, which under the Massachusetts statute of 1870 had already been in operation thirty years, were transferred to the Evening School of Trades. It will be seen that the work of this school now included thorough instruction in mechanical drawing, machine-shop practice and toolmaking, plumbing, joinery, cabinetmaking, wood turning and patternmaking, shop mathematics and electricity. The enrolment for the season of 1907-8 amounted to 396, and the attendance has always been remarkably constant, showing a much higher percentage than is common in evening schools. It was evident from the first that the expense of maintaining this important addition to the public school system of Springfield would not be a serious matter, and the successive city governments, almost invariably, have promptly voted the moderate sum required.

As a pioneer in this most practical phase of American public school work and also because of its prompt success, the Springfield Evening Trades School attracted very wide attention, not only in this country, but also abroad. Following the example of Springfield, other American cities—notably Cambridge, Hartford, and Cleveland—have opened up the shops of their manual training schools for the instruction of mechanics in evening classes. In every case the results have amply justified the plan of utilizing the equipment and teachers of manual arts schools already established for the instruction of mechanics, apprentices, or others closely associated with work in the manual arts, in such processes of the fundamental trades as could be well taught in this way.

The general aim of the evening trades schools is to give men already employed in the trades a chance to broaden their technical training and thus make themselves more efficient workmen. They have been sometimes classified as continuation schools, borrowing a term that is much used in designating evening schools for workmen in foreign countries. But they differ from foreign continuation

schools in one important respect, viz., in placing the major emphasis upon training in the school shops. Generally speaking, the object of the continuation schools of Germany and England is to extend the training of the elementary schools in language, mathematics, drawing, and science, with special reference to applications of these subjects in the leading industries of the community where the school is located. Direct training in the use of tools and machines is left to the shops and factories where the members of the school are employed during the day either on part time or on full time. In so far as evening trades schools of the American type give instruction in mathematics, mechanical drawing, and science, they resemble foreign schools of the kind referred to; but their main object at the present stage of their development is to supplement the imperfect and highly specialized training of modern shops by giving machine hands, helpers, and apprentices, so far as there are any apprentices, an opportunity to gain practice in a greater variety of actual shop work than is ever likely to be open to any one man under the modern system of machine production. The mechanic's chief aim in entering these schools is to acquire a wider range of practical knowledge and to improve the quality of his work in order to reach in his trade a higher classification, with increased wages. Some recent statistics of the Springfield Evening Trades School show plainly the general character of the clientele of such schools and the main purpose of those who attend. These facts appear in the following tabular statement, in which the figures given include the entire enrolment in the various classes:

	Machine shop	Mechanical drawing	Plumbing	Wood working	Electricity
Experience in trade taught:					
None	16	96	16	9	16
Less than one year	19	..	6	2	15
One to two years	12	2	13	5	1
Two to three years	19	..	8	4	..
Over three years	42	2	4	..	1
Some experience in other employment ..	77	96	21	9	18
Aim in taking course:					
To improve knowledge of trade	83	4	28	8	12
¹ To learn a trade	16	8	14	8	15
To gain general information	11	88	4	4	7

¹Apprentices in plumbing; merely beginners in other trades.

A comparative study of the statistics given in this table reveals several interesting facts. About one-third of the men were enrolled for instruction in the mechanical drawing classes. Only four per cent of these, however, had actually been employed in that line of work, and of the remaining ninety-six per cent eight per cent only wished to become draftsmen, while eighty-eight per cent were engaged permanently in some other work in which a knowledge of drafting would be of service. These figures sustain in a marked degree the statement often expressed with reference to the effect of the Massachusetts law of 1870, which requires all towns in the commonwealth of ten thousand inhabitants or more to maintain an evening drafting school. Contrary to the expectation of some of the framers of the law, these classes do not turn out draftsmen in large numbers, but they afford an opportunity for acquiring a knowledge of the meaning of working drawings and how they are made—information of great value in many occupations.

Turning to the table again, we find that more than two-thirds of the enrolment is for instruction in the strictly mechanical trades. This indicates a greater demand for the direct shop training peculiar to American trade schools than for the broader and more general, though no less practical instruction given in the continuation schools of foreign countries. It should be mentioned, too, that in the Springfield school, although tuition is free to all residents of the city, an incidental fee varying from \$4.00 to \$8.00 is charged in the machine shop, plumbing, woodworking, and electrical classes, while no fee at all is charged for mechanical drawing. This fact makes the larger total enrolment in the shop classes even more significant.

It will be noted also that a considerable number of those enrolled in the shop classes, particularly in the machine shop, had already had several years' experience in the trades they were following, and yet they felt the need of trades teaching. There were comparatively few beginners or apprentices. A considerable percentage of beginners, however, was found in the plumbing, woodworking, and electrical classes; and in plumbing these beginners were apprentices from the local shops. But in the machine shop we find that nearly half the men had had over three years' experience, while less than one-sixth of the enrolment was made up of beginners. Most of these men knew something about machine tool work. Their experience, however, had been limited to one machine or at most to

two or three. The school afforded them an opportunity to become familiar with a large number of the fundamental machine tools of the modern shop, an opportunity which the modern shop itself does not afford.

But perhaps the most significant fact of all revealed by the table is found in the large numbers who had had more or less experience in employments different from those which they were following or for which they wished to receive preparation in the trades school. About three-fourths of those enrolled in the machine shop had drifted into this work from other trades or occupations. Nearly half of those in the plumbing classes and in the woodworking classes had done the same thing. This is merely another demonstration of the well-known fact that large numbers of our young mechanics drift about from one employment to another, more or less unskilled, before they find themselves well enough grounded in any trade to be able to claim honestly a fair knowledge of it. In fact, the well-trained, skilful mechanic in any trade is rarely to be found.

Objection will be made that evening trades schools, though they may be able to do some good in the industrial world, must always fall far short of fully satisfying the demand for training in the trades. It is true that an ideal scheme of industrial education, which has for its object the upbuilding of all lines of industry, as the result of the training of the workers in skill and efficiency without neglecting their physical, intellectual, and moral well being, must assume the possibility of a more thorough and far more comprehensive plan of operation than can be carried out in any system of evening schools. But these schools do not claim to offer a complete and perfect solution of the problem of industrial education. They do offer, however, a partial solution of great value which may open the way to a very wide extension of public school work to meet the new demands of a machine-working age. So long as evening trades schools depend for their existence and for the scope of their work upon the shops and equipments of manual training schools, which are comparatively few in number and rarely extensive, their usefulness must be confined within comparatively narrow bounds. But why need they be thus confined? While the need for industrial education is one of the great public questions of the day, demanding the attention of educators, legislators and all associations of men

interested in social progress, it is also a question that appeals to the private interests of the manufacturer and the wage earner. It, therefore, calls for co-operation between the schools on the one hand, as representing public interests, and manufacturers' associations and labor organizations on the other, as representing private interests. Here is a wide field for co-operation in which the manual training schools, as now equipped and carried on, may be of service. What they need and what they should have, in order to make them more effective, is encouragement and enlargement through the co-operation of the other interests concerned. It would be an easy matter to enlarge the evening trades schools and extend their usefulness under public management if all the interests concerned would take hold of the matter earnestly and contribute their just share in expense and effort. This is already being done in some sections, and all friends of industrial education will find encouragement in the growth of the co-operative spirit.

It is admitted that evening trades schools at their best cannot fully meet industrial needs. They have their natural limitations. The courses which they offer must be brief and intensely practical. Evening work in itself, however keen the interest, lacks the freshness and vitality of similar educational work done in the daytime. The clientele of the evening schools is naturally made up of those beyond the ordinary school age or of adults, because the need for this training has been impressed upon them by their first contact with industrial life. Not all the workers, however, have come through the years of transition between the period of elementary education, if they had any, and the age when their productive work should begin, with a desire for training and an appreciation of its value. The greatest industrial need is an effective plan for taking advantage of our industrial resources. This problem will find its best solution without doubt in day trades schools. Meantime, and perhaps for many years, evening trades schools have their mission. They will attract large numbers and a great variety of workmen. Those who attend them will always have a definite and sincere purpose, and they will secure promptly the training and information which they need. The laborer, the employer, and the taxpayer will appreciate the value of such instruction. Such schools cannot fail to give a direct, practical solution to much of our present industrial need. This alone would be enough to justify every effort that may be

made for their further development. But these schools should interest the friends of industrial education for another reason. They will teach by example the possibility of trade training under public auspices and show the value of it to the manufacturer, to the wage-earner, and to the communities which both serve. This will be of great assistance in the solution of the problem of creating a complete and comprehensive system of industrial education in connection with our public schools.

Course of Instruction in the Springfield Evening School of Trades

MECHANICAL DRAWING.

Machine Drawing Course.

First Year.—(1) Working drawings from models and sketches. (2) Principles of projection. (3) Intersections of solids and development of surfaces.

Second Year.—(1) Screw threads. (2) Working drawings from sketches and models of machine parts. (3) Isometric drawing.

Third Year.—Mechanical Motions: (1) Cams. (2) Levers. (3) Gears.

An advanced course in Machine Design is open to those who have completed the course in Machine Drawing and who have the requisite knowledge in mathematics.

Architectural Drawing Course.

First Year.—Same as Machine Drawing Course.

Second Year.—(1) Details showing architectural construction. (2) The orders of architecture.

Third Year.—(1) Details of construction. (2) Architectural perspective.

An advanced course in Architectural Design is open to those who have completed the Architectural Drawing Course and are otherwise fitted for this work.

MACHINE SHOP PRACTICE.

Two Evenings Each Week for 24 Weeks.

First Year.—(1) Working in sheet metal—straight and curved forms—bench work. (2) Working in cast and wrought iron—chipping and filing—bench work. (3-4) Hand turning on speed lathe—(a) working to drawings, with practice in use of taps and dies—(b) working to template. (5) Straight and taper turning on speed lathe, with practice in use of slide rest. (6) Straight and taper boring on speed lathe, with use of slide rest. (7) Work on face plate—practice with center indicator. (8) Elementary work on engine lathe, shaper, and milling machine.

Second Year.—(1) Practice in straight and taper turning. (2) Practice in screw thread cutting. (3) Practice on milling machine, with use of index centers. (4) Practice in use of nut mandrels. (5) Chucking in lathe with

inside thread cutting. (6) Center rest problems on engine lathe. (7) Face plate work in connection with the laying-out plate. (8) Template work, with practice in irregular shapes.

Third Year.—(1) Vise work on planer or shaper. (2) Work on platen and strip of planer. (3) Work with use of V blocks on planer. (4) Work in connection with laying-out plate on planer. (5) Making and use of eccentric mandrel on lathe. (6) Making and assembling simple machines or fixtures, such as bench drills, bench centers, bench shears, milling cutters, grinders, drill jigs, milling fixtures, or punches and dies.

TOOL-MAKING.

Two Evenings Each Week for 24 Weeks.

First Year.—(1) Sheet steel gauges and templates—straight, angular, and curved forms—bench work. (2) Practice in turning to drawings—simple forms. (3) Shaping cutter blanks—straight and taper turning—use of slide rest. (4) Mill and model blanks—irregular shapes—turning to template. (5) Fly cutters and formers—bench work. (6) Shank mills and cutters—lathe and milling machine, with index centers. (7) Counterbores, with practice in hardening, tempering and grinding. (8) Practice in hand grinding and sharpening tools.

Second Year.—(1) Nut mandrel. (2) Thread arbor and mill. (3) Milling cutters—straight face and side cut. (4) Beveled and backed off milling cutters. (5) Special and irregular forms of milling cutters. (6) Spiral milling cutters, reamers, and twist drills. (7) Special practice in universal cutter grinding.

Third Year.—(1) Internal cylindrical gauges. (2) External cylindrical gauges. (3) Taps and dies. (4) Punches and dies. (5) Drill jigs. (6) Special work on universal milling machine and special features of tool work.

WOOD-TURNING.

(1) Explanation of the speed lathe and instruction in the use and care of tools. (2) Mounting work for turning between centers. (3) Exercises in turning between centers, such as plain cylinders, square shoulders, beads, grooves, tool handles, balusters. (4) Exercises in face-plate turning, and polishing work in lathes, such as rosettes, corner blocks, rings, boxes.

PATTERN-MAKING.

(1) Explanation of rules for allowances for shrinkage, for draft and for finish, both for iron and brass castings; and of the methods employed in varnishing and finishing patterns. (2) Making and finishing plain patterns, such as those for washers, lathe handles, face-plates, journal boxes, stuffing boxes and glands, bevel gear blanks, brackets, plain pulleys, cone pulleys, pillow blocks. (3) Making and finishing patterns which require core boxes, such as pipe elbows, tees, and valves. (4) Making and finishing patterns which require intricate coring, or other accurate work, such as patterns for

milling machine parts, for lathes, for complete pieces of school apparatus, for spur and bevel gears, for steam and gasoline engine parts.

CABINET MAKING AND FURNITURE MAKING.

The work in this course is limited to articles for home use, made according to special designs and drawings.

PLUMBING.

WATER SUPPLY.

Lectures—First Year Class.

1. Country Water Supply.—(1) Wells; (2) Pumps; (3) Tube Wells; (4) Hydraulic Ram.
2. City Water Supply.—(1) Water Mains; (2) Service Pipes.
3. Street and Tank Systems.—Street Main Connections.
4. Friction.—Water Hammer.—(1) Water Pressure Regulators; (2) Air Locks.
5. Meters.—Filters.—Tanks.—(1) Tank Valves; (2) Faucets; (3) Ball Cocks.
6. Boilers, Single and Double.—(1) Vertical and Horizontal Boilers, (2) Instantaneous Heaters; (3) Circulation; (4) Expansion.
7. Metals and Alloys.—Joint Making.

Practice Work—First Year Class.

The object of the practice work of the first year is to teach how joints on supply pipe work are made and to give practice in installing supply pipes and fixtures. It includes the following main topics:

Methods of joining metals. Tools. Names and use. Preparing pipe ends. Straightening pipe. Tacks—making and putting on. Cleaning and testing solder. Cup joints. Overcast joints. Wiped joints: Round, upright, and underhand; Branch, underhand, upright, side; Branch, 3-way, 4-way; Faucets and stop cocks. Packing bibbs and ball cocks. Setting up and connecting boiler with range and tank. Tank lining and general water supply.

SANITARY DRAINAGE.

Lectures—Second Year or Advanced Class.

1. Principles of Hygiene.
2. Sanitary Drainage.—(1) Subsoil Drainage; (2) Cesspools; (3) Cellar Drainage; (4) House Drainage; (5) Land Irrigation Disposal.
3. House Ventilation.—(1) Fresh Air Inlets; (2) Frozen Vent Pipes; (3) Drainage Ventilation.
4. Drainage Systems.—(1) Standard; (2) Durham; (3) Pike; (4) 20th Century.
5. The Siphon and its Action in House Plumbing.
6. Traps.—(1) Special Makes; (2) Grease Traps; (3) Proper Venting.
7. Fixtures—Arrangement and Care of Same.

Practice Work—Second Year Class.

Making joints on waste and drainage work; on 1¼-inch T branch, Y branch; on 2-inch ferrule, 4-inch ferrule; on flanges, side and upright; on electric conduit. Making bends, offsets, sand and spring; soil pipe joints, upright and underhand. Setting up soil pipe for various systems of venting. Setting up plumbing fixtures.

The supplementary course in lead burning includes instruction in butt seam, flat and vertical lapped joints, vertical and tee pipe joints, and tank lining.

SHOP MATHEMATICS.

The aim of the courses in shop mathematics is twofold—first, to teach the methods of computation necessary for the solution of the common problems arising in shop practice; second, to present in condensed form the essentials of algebra, geometry, and trigonometry for the benefit of those who have not had a high school training, and to show the applications of these subjects to the more advanced types of shop problems. This twofold aim leads to a natural division of the work into two courses:

Course I, Elementary—Shop Arithmetic.

This course comprises work with common and decimal fractions, measurements, percentages, ratio and proportion, square and cube root; applying these principles to such shop problems as gearing, simple and compound, how to select gears to cut screws and spirals, computations on the lever, including the lathe indicator, lever safety valve, the Prony brake; pulleys and hoists, simple, compound, and differential indexing with the milling machine; problems connected with the speed lathe and engine lathe, computing the horse power of steam engines, electric dynamos and motors.

Course II, Advanced—Algebra, Geometry, and Trigonometry, with applications to shop work.

This course is open to those who have completed Course I or who have had a preparation equivalent to a good grammar school education. It treats of the most important principles of algebra, especially of the equation as a means of solving problems, and of the derivation and use of formulas. The practical side of geometry is next taken, emphasizing the methods of finding areas and volumes, weights of bars of various shapes and materials, heating surface of boilers, etc. The last half of this course is spent on trigonometry including the use of logarithms and logarithmic tables and emphasizing the applications of trigonometry to the more advanced types of shop problems.

ELECTRICITY.**LECTURES.**

One lecture per week on the principles of electricity is given in both courses. The subjects are as follows:

- (1) Magnetism. (2) Static electricity. (3) Voltaic cells. (4) Storage

cells. (5) Electrolysis. Plating. (6) Electro-magnetism. (7) Applications of electro-magnets. (8) Heating effects of the current. (9-11) Measurement of current and resistance. (12) Ohm's law, electro-motive force. (13) Divided circuits. (14) Electric lighting. (15) Electro-magnetic induction. (16) Principles of dynamos and motors. (17) Armature windings. (18) Constructive details of dynamos and motors. (19) Management of machines. (20) Power stations. Railways. (21) Alternating currents. (22) Telephony. (23) High potential phenomena. (24) Wireless telegraphy.

LABORATORY INSTRUCTION.

Elementary Course.

The practical work for beginners aims to show by exercises in actual construction, the proper methods of installing various electric circuits, fittings and apparatus, simulating as closely as possible the conditions met with in outside work.

In addition to the practice in construction a few exercises in electrical measurements and tests are given.

The list of elementary exercises is as follows:

(1) Magnetic fields. (2) Study of simple voltaic cell and battery elements. (3) Study of two-fluid cell. (4) Setting up and connecting battery cells. (5) Helix, relation of polarity to direction of current. (6) Wire cutting, joining, soldering, taping. (7-11) Bell circuits. (12-14) Electric gas lighting circuits. (15-20) Two-wire incandescent lighting circuits. (21) Electro-plating. (22) Three-wire lighting circuits. (23-24) Three-wire circuits. (25) Measurement of resistance by substitution method. (26-27) Measurement of resistance by drop method. (28) Testing for grounds with magneto. (29) Insulation resistance by voltmeter. (30) Test of circuit breaker. (31-32) Connecting up and operating motor and dynamo. (33) Installation of intercommunicating telephone system. (34) Installation of intercommunicating telephone system. (35-37) Wiring switchboard for parallel operation of dynamos. (38) Operation of dynamos in parallel. (39) Operation of isolated lighting and power plant. (40) Calibration of ammeter by direct comparison. (41) Load curve reading and plotting from school plant. (42) Taping and winding small solenoid. (43-44) Cure and operation of "diseased" motor. (45) Measurement of watts taken by 16 c. p. lamp at different voltages. (46) Effect on resistance of temperature of filament of lamp. (47) Charge and discharge of small storage cell. (48) Winding of small motor parts for successful operation under current. (49) Candle power of incandescent lamps, photometer work.

Advanced Course.

In advanced work the wiring exercises are omitted and the following list of measurements and tests substituted:

(1-2) Calibration of tangent galvanometer by copper voltameter. (3) Measurement of resistance by Wheatstone bridge. (4) Effect of temperature on resistance. Specific resistance. (5) Measurement of the internal resis-

tance of cells. (6) Operation of motor. (7-8) Shunt characteristic of a dynamo. (9) Effect of field strength on voltage. Effect of speed on voltage. (10-11) Cure and operation of dynamo that fails to build up. (12-13) Operation of small motor and test of its brake horse power. (14) Effects of ampere turns on field. Compounding a shunt dynamo. (15) Practice in armature winding. (16) Practice in field winding.

THE SHORT COURSE TRADE SCHOOL

By J. ERNEST G. YALDEN,
Superintendent, Baron de Hirsch Trade School, New York City.

At the present time there is an unprecedented and widespread interest in the subject of industrial education. Skilled labor is scarce, and the available recruits for the industrial army lack those essential qualifications for craftsmanship which our future skilled workmen should possess. It is being generally acknowledged that trade schools are needed, but educators and others are by no means agreed as to the kind of schools best adapted to give our youth that training necessary to supply the qualifications for craftsmanship.

Many articles on this subject have lately appeared, but the tendency of most of the writers has been to discuss the need for industrial training, and suggest new plans for the establishment of various types of trade schools. Few have given us specific accounts of existing schools, with a critical examination of the methods by which they have for many years attempted to meet the demand for industrial training.

With that object in view I shall endeavor in this paper to define clearly the type known as the short-course trade school, to present a careful analysis of the reasons that have led to the establishment of such schools, and to show that they must continue to be a part of any complete system of industrial education. Let us for a moment consider the causes that have led to the present interest in the subject of industrial education.

Until very recent times it was thought sufficient to give all an opportunity to secure an elementary school training. The training for a vocation—professional, mercantile, or industrial—was obtained by a form of apprenticeship. In the development of the educational system to meet the requirements of modern conditions, it has been gradually extended so that at present teachers, lawyers, physicians, engineers and others are directly trained for their respective callings in professional or technical schools. Such a method is now accepted as an essential one for the preparation of those of our people who desire to enter those vocations. In view of present industrial and

economic conditions a further advance in our educational progress is necessary. We must as directly train our youth for the trades, as we now do for the higher vocations, and in doing this we must consider the needs of all grades of wage-earners in those trades.

It is growing more apparent that with few exceptions the tendency of the present training for trades, such as it is, has been mainly in the direction of preparing a small number who may be expected to become ultimately the leaders in those trades, to the neglect of the far greater number who must form the rank and file. Quite as important is the consideration of the needs of those who for economic reasons are unable to devote so long a period to preliminary training, and who are not mentally equipped to receive a training much beyond an elementary knowledge of reading, writing and mathematics; but do possess the natural ability and desire to become skilled mechanics. It is to those of our youth who wish to enter the mechanical trades, and who will in all likelihood become and remain skilled workmen, that the short-course trade school aims to be of service; rather than to the more fortunate ones who by their economic circumstances and exceptional natural capacity will no doubt rise above that grade.

While in some specific manufacturing industries employers are successfully training their own skilled workmen, such a method can never become general. In many industries, for example, the building trades, such a method is impracticable. Again, at the best this exceptional opportunity to learn a trade can be given to only a fortunate small number. Such a method is a business enterprise, and the bestowal of its benefits depends primarily on the question of the supply of labor, rather than the demand for industrial education. In general, it is safe to say that the great majority of the employers of labor realize the scarcity of skilled workmen and their own inability to train the material they now secure as apprentices or helpers.

Those of our youth who are compelled to enter unskilled occupations at an early age, and later have the desire and often the ability to become skilled workmen, have learned that it is practically impossible to obtain employment in any capacity in the mechanical trades unless they can show that they possess a certain amount of experience. That the opportunity for some form of industrial training appeals to these is evidenced by the growth of the correspon-

dence schools, the evening continuation schools, and the fact that the few existing trade schools are so well attended.

In any attempt to reach a decision as to the kind of trade schools best adapted to our present needs, it seems only logical also to consider the class of our youth who may be expected to attend them. The employers of labor claim that the quality of the present available recruits for the industrial army is poor, being incompetent, untrustworthy and altogether undesirable. The tendency of all the proposed remedies to improve this condition is an attempt to supply a better class of recruits by inducing those who are likely to be our future workmen to remain longer at school or until they are old enough to enter the skilled industries as beginners or helpers. They are to receive a special training which is to include practical work in trades with related academic studies. This training is, of course, intended to attract that very large number who now leave our schools between fourteen and fifteen years of age, to enter the unskilled occupations. If we are unable to retain them in the schools for that longer period, the remedy will fail to accomplish the desired result.

Manual training, which in many respects is similar to this proposed industrial training, and which likewise required an extension of time given to schooling, has entirely failed to prepare a sufficient number of our youth for industrial occupations. If manual training has failed, is it safe to assume that a similar form of industrial training will succeed?

While it is granted that a very large number do leave school at about fourteen years of age, it is claimed that many parents would keep their children at school for a longer period if such schooling would prepare them to enter skilled industries. Is this not merely the expression of a hope rather than a fact upon which to base the assumption that such schooling would accomplish the desired result? A similar hope was no doubt originally entertained at the time of the introduction of manual training.

It is of importance to understand from what sources our present skilled labor is recruited. The last census informs us that about sixty per cent of those engaged in manufacturing and mechanical pursuits are foreigners or natives of foreign parentage, and the remaining forty per cent comprise those native Americans who do not regard such occupations as undesirable or lowering

to self-respect, and are contented to become and remain skilled workmen. It is the children of these classes that in such large numbers are leaving our elementary schools before the completion of the course because it is necessary for them to contribute to the family support as soon as the law permits them to obtain employment. Chiefly from this class it is unquestionably true that the ranks of our future workmen will continue to be recruited or until the time when another class of our American youth shall cease to regard the skilled mechanical trades as undesirable occupations. In justice to this large and willing class we must endeavor, by giving them the opportunity to secure better industrial training, to improve their standard and to make them more competent, trustworthy and desirable as recruiting material.

In the future, under better economic conditions, when certain children of fourteen years of age shall not be compelled to work, it is conceivable that we may be able to accomplish this in a better manner, yet to-day the short-course trade school appears to be the most practical way of securing adequate results. There are two well-known short-course trade schools that have in the past ten years or so turned out several thousands of graduates, a very large percentage of whom are to-day journeymen mechanics earning good wages, and as such are useful and necessary members of the community. Such schools of all the types so far evolved for the purpose have conspicuously accomplished results sufficient to warrant their existence. Again, demand is generally a safe indication of worth when applied to a question of this nature. Both of these schools annually turn away for lack of accommodation several hundred applicants for instruction, although those attending the schools are in nearly all instances wage-earners who make a sacrifice of money and a certain wage-earning period in order to undertake a course of instruction which they are convinced will benefit them materially. Young persons of this character are not apt to remain long in doubt as to the real value of such schools.

While the fact is to be regretted that a very large number of our youth upon leaving the elementary schools devote the next few years of their life to unskilled labor, rather than further schooling, yet it cannot be denied that by so doing they gain some advantages. Such a course develops a sense of responsibility among the more capable, and an earnest desire to change their unskilled vocation

for a skilled one with its higher reward. They realize in a very short time the limitations of their position in life, and are, therefore, much better fitted to appreciate and derive benefit from any available opportunity to improve their condition. That the short-course trade schools now in existence have offered this opportunity cannot be denied, and by virtue of their success, I believe I am fully justified in recommending to the consideration of all interested in the problem of industrial education, this particular type of trade school. The establishment of similar schools would at once meet a present urgent demand for some form of industrial training.

The aim of the short-course trade school should be to provide an opportunity for a carefully selected number to secure in as short a time as practicable a sufficient training to enable them to obtain employment in the skilled trades as beginners or helpers. Under this plan it is assumed that an efficient short course of industrial training, followed by that practical experience gained by working at a trade, will suffice to give that degree of skill now required of the average skilled workman. This training should be given only to those of an age possessing the physical ability and sense of responsibility required of such a class of labor. Employers in the skilled trades do not want beginners or helpers under sixteen years of age, and in many cases require them to be some years older.

The main points to be considered in the organization and establishment of a short-course trade school are the following: Plant, location, instructors, courses of instruction and requirements for admission and graduation.

The plant should consist of a suitable building properly equipped to give instruction in several trades, and to accommodate at one time several hundred pupils. This is far more efficient and economical than the establishment of scattered trade classes. The location should be where the demand is most urgent; that is, as convenient as possible to the homes of the working class. The teaching force should consist of a superintendent and a corps of instructors. The superintendent should be a technically trained man with practical experience, a good executive officer and administrator; the instructors, mechanics of the grade of foremen, not necessarily graduates of technical or manual training schools or trained teachers as generally understood. To familiarize the pupils with shop methods and customs, they should be mechanics who have worked

and risen in the trade, and who will be an example to the pupils whose ambition will be to attain a like skill. The trades taught should be those for which locally there is the largest demand for workers.

The length of the courses need not much exceed five months, which would permit two classes a year to be under instruction. This instruction should be given in day classes of eight hours each—the regular working day—giving approximately eight hundred working hours to a course.

The work of the courses should comprise academic and shop instruction. The academic instruction should consist of mechanical or freehand drawing, and elementary mathematics with especial attention to “shop arithmetic,” and illustrated lectures on the theory and principles of the trades. The period devoted to this should be about one hundred and fifty hours. The shop instruction should approximate as nearly as possible to the actual performance of the practical operations of the trades, with the purpose of giving the pupils a general familiarity with those different operations. This would require about six hundred and fifty hours of instruction. Speed of execution and further experience will be best acquired by actual work at the trades.

The pupils for such schools should be selected with great care, and those who fail to pass a short probationary period satisfactorily should be dismissed. It is poor judgment and worse philanthropy to permit youths to learn trades, however great their desire, unless they possess a certain natural capacity and fitness for the work.

The principal requirements for admission should be a proper degree of maturity and physical ability to perform the work demanded of a helper. On that account pupils should not be admitted under sixteen years of age. The possession of an elementary school training is necessary, but too much stress should not be laid upon educational qualifications, as a youth of intelligence who has had an ordinary schooling can readily acquire such education as is essential while learning the trade.

In order to maintain efficiency frequent examinations must be held during the course, and at its completion any pupil who does not possess the necessary ability of a helper should not be granted a certificate of proficiency.

Evening classes in elementary industrial training¹ are seriously objectionable for the following reasons: Twenty-two weeks of day class instruction are required as a minimum to properly equip pupils to enter trades as helpers. One hundred and seven weeks of evening class instruction, or approximately three school years, are necessary to give that equivalent, and the percentage of those completing the course would in consequence be much smaller, as many would not remain for that length of time. As a result pupils would seek work in the trade before they were fully prepared, which would at once reflect upon the standing of the schools and defeat their aim. We have only to consider in such existing schools the percentage of the original enrolment that complete the course to be convinced of this fact. Again, by offering such training in the evening we would make it easy for a great number to attempt to learn a trade at no sacrifice on their part, and in consequence such schools would be overrun with applicants who have no very definite aims. But, as such instruction could be undertaken without interfering with their usual employment, they would be tempted to try the experiment, thus giving as a result a very low percentage of efficiency and great waste of effort.

On the other hand, those attending the short-course day classes will be compelled to make a sacrifice of a certain wage-earning period, and as a result will appreciate the advantages in proportion to that sacrifice. Nearly all who attend will have definitely determined to earn a trade, and to make that particular trade a means of livelihood. In general, it is safe to assume that the greater the sacrifice the greater the appreciation.

There are among the privately established trade schools in this country several of the short-course type, and in one case² such a school has been incorporated in the public school system. While the oldest example, and in fact the first successful trade school established in this country, is the New York Trade School, founded by the late Richard T. Auchmuty in 1881, I shall describe for pur-

¹ "The chief objective point of recent legislation for industrial schools in Wurtemberg, Germany, is to furnish opportunity for instruction during the work days, instead of evenings, Sundays, or holidays, as before."

"The minimum number of hours per year is to be two hundred and eighty, and the courses will extend over a term of three years, making a total of eight hundred and forty hours."—"The Industrial Improvement Schools of Wurtemberg," by Albert A. Snowden, *Teachers' College Record*. (New York), November, 1907.

² Milwaukee School of Trades, Milwaukee, Wis.

pose of illustration the Baron de Hirsch Trade School, which I believe more nearly approaches in its plan and accomplishment the type of school to be desired.

The Baron de Hirsch Trade School of New York City was established in the fall of 1891 by the Baron de Hirsch Fund. The school has been in existence for seventeen years, and while at first it was difficult to secure pupils, at the present time the number of applicants far exceeds the capacity of the school. The annual expense to graduate 260 pupils amounts to \$34,500, or \$132 per capita. The object of the school is to fit young men, in as short a time as possible, for employment in the mechanical and building trades. For this purpose it is the aim of each of the courses to give the pupil a sufficient practical working knowledge of a trade to enable him readily to secure employment in that trade as a helper, and enough of the theory of the trade to prepare him for certain and rapid advancement to the grade of journeyman.

Instruction is given in day classes only, because it is believed that evening classes are not an efficient means for training beginners. Two classes are admitted each year, one in February and one in August, and pupils are not admitted during the term. Each of the courses requires five and one-half months for completion on the basis of eight hours a day, giving eight hundred and thirty working hours to a course.

Applicants for admission must be Jews, able-bodied, at least sixteen years of age, and must satisfy the superintendent as to their fitness to learn a trade. The average age of the pupils admitted is seventeen and one-half years. They, therefore, are generally old enough to have a definite purpose in view and a full appreciation of the value of the training received. Each applicant must be able to speak, read and write the English language. This was made a requirement owing to the fact that some sixty per cent of the pupils are recent immigrants.

There are no tuition fees, but applicants must show that they have some means of support while learning the trade. Over ninety per cent of the pupils are wage-earners before entrance to the school, and it is recognized that the sacrifice of a wage-earning period is sufficient to make them realize that they are paying something for their instruction. All accepted applicants are given a trial during a probationary period of fourteen working days, and at the end of

that period, if the pupil has shown sufficient earnestness and aptitude, he is enrolled as a regular member of the class.

Courses are provided in the following trades: machinist, carpentry, electrical work, plumbing, house and fresco painting and sign painting. Each course is planned to give the pupil seven hundred and forty hours of practical shop work, and ninety hours of correlated academic work. The practical shop work is directly in charge of instructors who are skilled mechanics of long experience. The shop courses are designed to give a maximum amount of actual practice at the various operations of the trades, and all work is done as far as possible in the same manner as in actual practice.

The theoretical side of the trade is explained in frequent lectures and shop talks. Various diagrams and models are used to clearly illustrate the subjects, and the shop notes are taken down by the pupils to be afterward carefully copied at home into notebooks especially provided for that purpose. They are at the same time given suitable printed diagrams and tables for purpose of illustration, and these are to be bound up with their shop notes.

The academic work includes instruction in mechanical and geometrical drawing, mensuration and shop arithmetic. The instructors are technically trained men and skilled draughtsmen. As the shop work is done when possible from working drawings, the course in drawing is made to correlate directly with the shop courses. Primarily the course is intended to enable the pupils to read working drawings, not to train draughtsmen. The practice in geometrical drawing is given as a very useful and efficient form of mental training to show the necessity of accuracy of workmanship. The course in arithmetic includes a review of the fundamental elements required of those pupils who are deficient in the subject; and a course in mensuration, with explanation of the fundamental formulas and practice in the application of them to practical problems of the trades.

During the term frequent examinations are given, and those pupils who fail to attain a required standard of efficiency are dismissed from the school. At the termination of the course a final examination is given, and each graduate is given a certificate and a kit of tools.

The school has enrolled to date 2,464 pupils, of which 2,062 have graduated. An average of eighty-four per cent of those

enrolled remain throughout the course and graduate. Attempts are made to keep in touch with recent graduates, which have proven successful with about sixty per cent of those of three years' standing. Their reports show that at least eighty per cent are employed in the trades learned at the school.

A recent investigation has shown that the average wages of some two hundred pupils before entrance to the school was \$5.39 per week. They were engaged in the various unskilled occupations that do not require any previous training or preparation. After receiving a five and a half months' course as a special preparation to enter trades, they earned immediately after graduation an average of \$7.54 per week, or a gain of \$2.15 due to their ability to enter a skilled trade. There has been such a demand for skilled helpers that graduates find little difficulty in obtaining employment at wages ranging from \$5.00 to \$15.00 a week, and in about two years' time many graduates are able to earn journeymen's wages.

In order that schools of this type may be a real benefit to the community they must, by a careful selection of pupils and a rigid insistence on earnest and thorough work, maintain such a standard of efficiency that employers of labor will prefer, and perhaps finally insist, that all those seeking employment as beginners in the skilled trades shall have had a preliminary training in a trade school.

THE MILWAUKEE SCHOOL OF TRADES

BY CHARLES F. PERRY, S.B., M.E.,
Director.

To trace the existence of the Milwaukee School of Trades, from its present position as part of a public school system, sustained by municipal funds, to its source, is to study the same means which has led to the introduction of kindergarten and manual training schools in our public instructional systems the country over—namely, private, philanthropic initiative.

This school owes its existence to the foresight and initiative of Frederick W. Sivyer, president of the Northwestern Malleable Iron Company. He had always evinced a keen interest in the education of the youth of his native city. For seven years he was a member of the Milwaukee board of school directors and during much of that time was chairman of the manual training committee. On the evening of February 2, 1904, during his inaugural address as president of the Merchants and Manufacturers Association he presented to that body the need of industrial education for the youth of the community and asked for their earnest consideration of the problem.

His request met with an immediate and hearty response. A committee was appointed to gather data regarding trade schools here and abroad. Loyal support was pledged to the movement. In the fall of 1905 part of the original premises of the Pawling and Harnischfeger Company, manufacturers of traveling cranes, was rented, and on January 2, 1906, the doors of the Milwaukee School of Trades were opened to sixty young men eager to become skilled workmen. At first, instruction in but two trades was given, namely, pattern-making and plumbing in the day and night classes. In September of the same year the machinist trade was added to the curriculum.

Early in the year 1907 a problem, which gradually had been growing more and more serious, had to be fairly met and solved. It was a question of finances. To charge students the cost of their tuition in a properly conducted trade school means to debar the very

ones who need the instruction. Equally impractical is it to expect a few to bear the expense of a work so valuable to the entire community. The need of such a school was proven the first day it opened its doors. From its outset it was making better workmen and better citizens. It was the opportunity and privilege of the Merchants and Manufacturers Association to start such a work in the life of a city, but it was not its bounden duty to continue it. The child grew beyond the power of its parent to support it. Since the work brought a rich harvest to the municipality, the municipality should bear the expense of the sowing. The solution of the problem lay in having the trade school included in the public school system of the city. To do this, a tax, additional to the one already levied for the public schools, was necessary. This extra assessment could be collected only by the permission of the state legislature. Consequently, a bill was prepared and presented to that body early in 1907. It met with immediate endorsement in both assembly and senate. It passed and became effective July 1, 1907. There has been such a demand upon the state librarian for copies of this act that all the official copies for distribution have been exhausted. A copy is printed at end of this paper.

The Milwaukee board of school directors immediately seized its opportunity to take over a trade school well equipped to teach three trades and with one and one-half years' experience in pioneer work. On account of this progressive step on the part of the public school authorities the original subscribers deeded the entire equipment of the school to the city in fee simple.

The passage of the act made two vitally necessary things possible, namely, a longer and more thorough course, and free tuition. More floor space was rented and preparations made to include another trade in the curriculum, namely, a thorough course in wood-working. Instruction in this new department began July 1st of the present year. This is a brief history of the school up to the present writing. A concise description of our present equipment and policy follows.

Instruction is given in day classes in four trades: Pattern-making, machinist, and wood-working, requiring two years of fifty-two weeks per year, and the plumbing trade, which requires one year. The working hours are from 8.00 to 12.00 a. m., and 1.00 to 5.00 p. m., each day of the week excepting Saturday afternoon. Allow-

ing seven legal holidays per year, the total apprenticeship term in the first three trades is 4,464 hours, and in the plumbing trade 2,232 hours. Night classes are in session from October 1st to April 30th yearly, from 7.30 to 9.30 o'clock. Each student attends four evenings per week. Tuition is free in the day and evening classes to all young men of Milwaukee between sixteen and twenty years of age who meet the entrance requirements. To all non-residents, or residents over twenty years of age, a charge of fifteen dollars per month in the day, and four dollars per month in the night classes is made. This charge is slightly under the actual cost to the taxpayer for each student. For all students receiving free tuition a charge of four dollars per month in the day, and one dollar per month in the night classes is made for the material used. This also is slightly under the cost to the taxpayer.

In order to receive free tuition a student must be over sixteen and under twenty years of age. He must be able to read and write in English and perform the fundamental processes in arithmetic. He must also show a marked aptitude for his chosen trade. Graduates of the eighth grade, or students capable of passing examinations equal to those of that grade, are given the preference for admission. The work of the students comes under five separate heads: Trade instruction, mechanical drawing, workshop mathematics, lectures and illustrated talks on subjects pertaining and allied to the trade, including practical physics, chemistry, metallurgy, electricity, etc., and shop inspection trips. Approximately three-fourths of a student's entire apprenticeship is devoted to actual trade practice, the rest of his time is required for the four remaining subjects which are all vitally essential to the intelligent mechanic.

Each trade is equipped for twenty-five students excepting the machine shop which has a capacity of forty. Thus, the total capacity of the school is two hundred thirty students, divided into one hundred fifteen each in day and night classes. The equipment in all departments is of the highest possible grade. The machine shop contains twenty engine lathes, two universal milling machines, two universal grinders, two shapers, three drilling machines, one die slotter, one automatic spur and bevel gear cutter, one speed lathe, fourteen vises, a tempering outfit, and full equipment of standard small tools. The pattern-making and wood-working trades are equipped with twenty-five benches each. Each

bench is supplied with a separate and complete set of tools in order to prevent conflict between day and night students. The machinery in the pattern shop consists of a universal circular saw, band saw, jointer, planer, large gap lathe, five small lathes, band saw setting and filing machine, and grindstone. The machinery of the wood-working department consists of universal circular saw, band saw, jointer, planer, shaper, molder, tenoner, horizontal borer, jig saw, knife grinder, large lathe, mortiser, four small lathes, bench grinder, and grindstone. The plumbing shop is thoroughly equipped with separate departments for day and night classes.

The entire atmosphere of the school is made as nearly like that of actual commercial manufacturing life as possible. Promptness, close attention to work, and the highest possible standard of workmanship are insisted upon. The moral atmosphere of the school is carefully guarded. Tobacco is not permitted to be used in any form on the premises. Each boy is a class by himself. A diploma of graduation is given each student completing the course in a satisfactory manner, even though he finishes it in less than the prescribed time. He is taught to realize that the grade he receives for his work corresponds with the pay the completed task would bring him as a journeyman. His marks are based, first, upon quality of workmanship; second, time required to do the work; third, his attitude and application to his duties.

The most urgent problem confronting the board of school directors of this city at present, in its industrial education, is what to do with the boy between graduation from the grammar school and his admission to the trade school at the age of sixteen. The state law making it necessary for the boy to be sixteen years of age before being permitted to enter the trade school is an excellent one, providing the public school system furnishes a plan which will make every boy, who wishes to become a skilled artisan, willing to wait until sixteen to enter the trade school. A suggested solution is as follows: To introduce a trade school preparatory course into each one of the four high schools of the city, each one of which is already excellently equipped to teach manual training. This course might properly include shop work, mathematics, and required reading on industrial and commercial subjects from which further practice in English may be had. Thus, this hitherto unspanned gap may be filled with comparatively small cost to the city.

The future of industrial education in Milwaukee is bright. The Merchants and Manufacturers Association builded better than it knew when it set its hand to the task. The public school authorities are giving the entire problem most loyal support. It is hoped that the work may be extended so that the girls of Milwaukee may also be able to obtain the advantages of vocational training.

APPENDIX

[No. 75, S.]

CHAPTER ..., LAWS OF 1907.

AN ACT to create sections 926—22 to 926—30, inclusive, statutes, providing for the establishment and maintenance of trade schools in the State of Wisconsin.

The people of the State of Wisconsin, represented in Senate and Assembly, do enact as follows:

SECTION 1. There are added to the statutes nine new sections to read:

Section 926—22. Any city in the State of Wisconsin or any school district having within its limits a city desiring to establish, conduct and maintain a school or schools for the purpose of giving practical instruction in the useful trades to persons having attained the age of sixteen years, as a part of the public school system of such city, is empowered to do so by complying with the provisions of sections 926—23 to 926—30, inclusive, statutes of 1898.

926—23. Such trade school or schools shall be under the supervision and control of the school boards of the respective cities or school districts in which they may be located.

926—24. The school board of every such city or school district is given full power and authority to establish, take over and maintain a trade school or schools, equip the same with proper machinery and tools, employ a competent instructor or instructors, and give practical instruction in one or more of the common trades. Such a trade school shall not be maintained, however, unless there be an average enrollment of at least thirty scholars.

926—25. Whenever any school board shall have established or taken over an established trade school, such school board may prepare the courses of study, employ instructors, purchase all machinery, tools and supplies, purchase or lease suitable grounds or buildings for the use of such school and exercise the same authority over such school which it now has over the schools under its charge.

926—26. Whenever any school board shall have established or taken over an already established trade school or schools it may appoint an advisory committee, to be known as the committee on trade schools, consisting of five citizens, not members of the school board, each of whom is experienced in one or more of the trades to be taught in the school or schools, to assist in the administration of the trade school or schools located in that city, which com-

mittee shall be appointed by the president of such school board with the approval of a majority of the board. Such committee shall have authority, subject to the approval and ratification of the school board, to prepare courses of study, employ or dismiss instructors, purchase machinery, tools and supplies, and purchase or rent suitable grounds or buildings for the use of such trade schools. When any such committee on trade schools is appointed two of its original members shall be appointed for the term of one year, another two for the term of two years, and the fifth member for a term of three years, and thereafter, each member of said committee shall be appointed for the term of two years. In case of any vacancy during the term of any member of said committee, said school board shall fill such vacancy by appointment for such unexpired term.

926—27. Students attending any such trade school may be required to pay for all material consumed by them in their work in such school at cost prices or in lieu thereof the school board may establish a fixed sum to be paid by each student in each course which sum shall be sufficient to cover, as nearly as may be, the cost of the material to be consumed in such course; any manufactured articles made in such school may be disposed of at the discretion of the school board, and the proceeds shall be paid into the trade school fund.

926—28. Whenever any such school board shall have decided to establish a trade school or schools, or to take over one already established, under the provisions of this act, a tax, not exceeding one-half of one mill on the total assessed valuation of such city shall be levied upon the requisition of the school board, as other school taxes are levied in such city; the fund derived from such taxation shall be known as the trade school fund, shall be used in establishing and maintaining a trade school or trade schools in such city, shall not be diverted or used for any other purpose whatsoever, and may be disposed of and disbursed by the school board of such city in the same manner and pursuant to the same regulations governing the disposition and disbursement of regular school funds by such boards.

926—29. Any school board desiring to avail itself of the provisions of this act, may, before the trade school fund herein provided for becomes available, establish, take over, equip and maintain a trade school or schools out of the regular school funds which may be at the disposal of such school board, provided, however, that all moneys used for these purposes out of the regular school funds shall be refunded within three years from the trade school fund.

926—30. 1. When the school board of any city of the second, third or fourth class, or the school board of any school district having within its limits such a city, shall determine to establish, take over, conduct or maintain such trade school, it shall publish notice of its intention so to do with a copy of the resolution or order expressing such determination once each week for four successive weeks in a newspaper published in said school district and shall take no further steps in said matter until the expiration of thirty days from the date of the first publication.

2. If within such thirty days there shall be filed with the clerk of such city a petition signed by a number of electors of the school district equal to twenty per centum of the number of votes cast in said city at the last

municipal election praying that the question of the establishment, taking over, conduct and maintenance of such trade school shall be submitted to the vote of the electors of such school district, the city clerk shall at the earliest opportunity lay such petition before the common council. The common council shall thereupon at its next regular meeting by resolution or ordinance direct the city clerk to call a special election for the purpose of submitting such question to the electors of such city and school district.

3. Such election shall be noticed and conducted and canvassed in accordance with the provisions of section 943, statutes of 1898. All electors within the territory constituting such school district, qualified to vote at any election pertaining to school district matters shall be entitled to vote.

4. If any of said school districts shall be beyond the limits of such city, the city clerk shall immediately upon the passage of the resolution or ordinance by the city council ordering such election, transmit a copy thereof to the clerk of the town or towns of which such territory is constituted. The clerk or clerks of said towns shall thereupon cause a notice of such election to be given and such election to be held and canvassed as provided in section 943.

5. If a majority of the ballots cast in such school district shall be in favor of the establishment, taking over, conducting or maintenance of such trade school, then such board shall proceed as heretofore provided to establish, take over, conduct and maintain such trade school. But if a majority shall vote against such proposition to establish, take over, conduct and maintain a trade school, the board shall take no further steps towards such end.

6. If no petition to submit such proposition to establish, take over or maintain a trade school to the vote of the electors shall be filed with the city clerk within thirty days after the first publication of the notice of the determination of the school board to take such action, then such school board may proceed as hereinbefore provided without submitting such proposition to the electors of the district.

.....
President of the Senate.

.....
Speaker of the Assembly.

This act originated in the Senate.

.....
Chief Clerk.

Approved, 1907.

.....
Governor.

THE PHILADELPHIA TRADES SCHOOL

BY WILLIAM C. ASH,
Principal.

As the result of an effort on the part of the Master Builders' Exchange of Philadelphia to establish a trades school in connection with its work, Mr. Murrel Dobbins, a member of the Exchange and of the Board of Public Education, interested himself in the movement, and through his activity there was opened in this city the first trades school as an integral part of the public school system in the United States.

After the question of the addition of industrial education to the public school system was introduced by Mr. Dobbins, a committee was appointed to investigate industrial conditions in Philadelphia and report the trades which were most practiced in and about the city.

Following the report of the committee on investigation an abandoned school building at Twelfth and Locust streets was equipped with work benches and tools and in September, 1906, was opened for the registration of students in the following trades: Bricklaying, carpentry, plastering, plumbing, printing, blacksmithing, house and sign painting, electrical construction, architectural drawing, mechanical drawing, sheet metal working, pattern-making and pipe-fitting.

Owing to the lack of sufficient registration in seven of these trades, they were abandoned in the day school course. The school is in session regularly during each school day of the year from 9 a. m. to 12 m. and from 12.30 p. m. to 3.30 p. m. Instruction is offered in the following trades: Carpentry, architectural drawing, mechanical drawing, electrical construction, pattern-making and printing. The shop instructors are skilled master mechanics in their trades.

The aim of the school is the development of intelligent, self-respecting citizens, young men who after a short experience in actual work should make the highest type of American workmen. To this end an effort is made to stimulate an interest in and dignify the calling to which the students will go. The school does not aim

to prepare its students for any higher institution of learning, and so does not in any way overlap the usefulness of the existing high or manual training schools.

Of the thirty school hours in the week fifteen are spent in the shop work of the trade selected and fifteen are devoted to the study of English, mathematics and drawing. In all the academic work an effort is made to present actual shop problems and trade literature. In English the course includes grammar, sentence structure and some cultural English, letter writing and business forms, commercial history and commercial law.

The mathematics includes algebra, geometry, bookkeeping, and in some of the trades trigonometry. Problems are given in estimating from specifications. In the drawing room the work is in keeping with the trade being studied.

Arrangements have been made whereby, in the third year in all the trades, the students will spend from four to six weeks at actual work in their trades with various industrial establishments throughout the city. In this way we hope to approximate a finished workman.

Owing perhaps primarily to the general impression that manual labor is degrading and to the ignorance on the part of the public in general and of the public school teachers in particular of the existence and purpose of the Trades School, one of the difficulties has been to get children to take up the work of the school. This difficulty is gradually being overcome as the teachers in the elementary schools learn of the school and by their directive influence point those boys who are industrially inclined to the school which will best fit them for the highest service and make them of most value to society.

During the school year of 1906-1907 the enrolment in the day school averaged forty-five. The next year the number on the roll increased to one hundred and twenty-five, and this current year there are two hundred and twenty-five young men at work in the various trades. The average age of the students is sixteen years and six months.

The student body is made up principally of boys who finished the work in the grammar grades and were transferred directly to this school, but about thirty per cent of the young men have been out of school for a length of time varying from six months to five

years, and are now taking advantage of the opportunity offered for definite trade instruction. Some of this smaller group are supporting themselves by working at night; others have quit their employments and are devoting their entire time to the work of the school.

The courses in all the trades have been arranged to cover a period of three years. Students satisfactorily completing any of these courses will be graduated and presented with a diploma by the Board of Public Education.

Report of cost of Day Trades School for the year 1907-08

Departments.	Average enrolment.	Total cost per department.	Annual cost per pupil.	Value of work done per department.	Net cost per department.	Net cost per pupil per department.
Drawing, architectural....	13.6	\$869.58	\$63.94	.....	\$869.58	\$63.94
Drawing, mechanical.....	25.1	1,608.47	64.08	.....	1,608.47	64.08
Electrical construction....	67.3	4,545.55	67.54	\$129.00	4,416.55	65.62
Carpentry.....	7.4	519.32	70.18	82.62	436.70	59.01
Patternmaking.....	9.8	688.07	70.21	109.38	578.69	59.04
Printing.....	16.8	1,864.82	111.00	779.30	1,085.52	64.61
Total.....	140.0	\$10,095.81	\$72.11	\$1,100.30	\$8,995.51	\$64.25

*Average cost per pupil

The evening school is in session from 7.30 till 9.30 five nights per week from October 1st until the third week in April. In addition to the trades taught in the day school the following are taught in the evening school: Bricklaying, plastering, plumbing, pipe-fitting, sheet metal working and house and sign painting.

From the beginning of the movement in Philadelphia the demand for instruction in the evening trades school has exceeded the capacity of the building. In 1907 a second evening school was opened in the annex of the Northeast Manual Training School, at Howard street and Girard avenue, and the work has been so arranged that two groups of students can work in each school, each group attending on alternate school nights. Even with this arrangement, the number of young men registered and waiting admission exceeds the number in attendance in both groups.

Plans are being considered by the Board of Education for the extension of the system of evening trades schools by building the basements of all new school buildings so that they may be used in part for instruction in one or more of the trades.

The courses in the evening school do not include any academic work. The entire school time is given to instruction in actual

trade work by skilled master mechanics in the various trades. The average age of the evening school students is twenty years. The percentage of students who are at work during the day in the trades being studied varies from sixty-six to fifteen.

Following is a detailed report of cost for the Evening Trades School for the school year 1907-1908:

The numerals at the head of the columns indicate:

1. Average membership.
2. Average cost per pupil per term.
3. Average value, per pupil, of commercial product furnished the Board of Public Education or expended in the betterment of the school building.
4. Net cost of pupil per term.
5. Net cost per pupil per session of two hours.

	1	2	3	4	5
Blacksmithing	15.1	\$36.69	\$10.61	\$26.08	.21
Bricklaying	33.2	33.20	.60	32.60	.26
Carpentry	33.7	24.77	.....	24.77	.19
Drawing	56.3	16.62	.....	16.62	.13
Electrical	110.	16.85	.....	16.85	.14
Painting	28.5	21.92	6.94	14.98	.12
Patternmaking	28.9	18.69	.52	18.17	.14
Plastering	13.1	36.78	4.58	32.20	.27
Plumbing	49.6	25.80	.02	25.78	.21
Printing	28.5	23.22	7.03	16.19	.13
Sheetmetal	38.2	27.06	1.24	25.82	.21
Pipefitting	15.4	44.21	6.62	37.59	.30

THE MANILA TRADE SCHOOL

By J. J. EATON,

Former Superintendent, Philippine School of Arts and Trades; Director,
Ludlow Textile School, Ludlow, Mass.

Industrial education in the Philippines is probably the most important and difficult problem that the Bureau of Education is solving. The varying local conditions, the diversity of tribes and consequent difference in dialects and methods of living require individual attention. As iron work of any description does not enter into the native house, the principal parts of which are palm leaves and bamboo, very few tools are required by the builder. As a matter of fact, his whole equipment may consist of a big strong butcher knife called a "bolo." The obvious advantages of such simplicity cause one to wonder if any change is really to benefit the native; but, right or wrong, the change is taking place, and it becomes the duty of the white man to see to it that the native receives proper training for life under the new conditions.

From the viewpoint of the American the scarcity of native skilled labor and the necessity for making the Filipino self-supporting at an early date required that industrial education be given immediate attention in the Philippine Islands. Therefore, by act of the Philippine Commission \$10,000 was appropriated for the establishment of a trade school in the City of Manila. This money was available for use when the first large contingent of American teachers arrived in Manila, in August, 1901.

As no school equipment could be immediately obtained, the teachers assigned to the trade school were formed into a committee to investigate the various industries of the City of Manila. Agricultural work was not investigated, but was left to the consideration of the agricultural school. Naturally, the first places visited were the large factories. Chief among these were the cigar and cigarette making establishments. Marine work, both construction and repair, was also performed in large shops. In all these places it was observed that the work requiring greatest skill was performed by Chinamen, and, according to the statement of an English superin-

tendent, fully fifty per cent additional men were kept on the rolls in those branches in which the natives worked because of the Filipino's disinclination to work a full week. It was also observed that a great deal of carpentry work was being carried on, but with few Filipinos doing any of the skilled labor. Plumbing of whatever description was unknown in the homes of most of the inhabitants of the city. There were few good blacksmiths and no native shoemakers. Wood carving, jewelry making and tailoring seemed to show that the Filipino could perform very creditable work if the work pleased him; and to please him it must not be too laborious. It should be stated, however, that, upon becoming better acquainted with the native, these early impressions were slightly modified.

The investigations of the committee showed the advisability of introducing trade courses in plumbing, carpentry and drawing. All of these courses were to be supplemented by instruction in colloquial English and practical arithmetic and were to be as complete as possible. The object was to prepare the pupil for his life-work and not for a higher institution of learning.

Buildings which had been erected by the Spaniards for use in their exposition of 1895 were secured as the first home of the school. These houses were single-story affairs, of wood and plaster, with tile floors and the customary shell windows of the islands. They were located about a mile from the heart of the city. Considerable difficulty was experienced in obtaining tools and supplies, as practically all material had to be purchased in the United States. This caused a delay, but a few sets of tools were obtained in the city and a beginning was made. Plans were arranged for teaching shop classes of twenty-four pupils each, and eventually complete bench equipments for this number were obtained and installed.

The school was well advertised and any Filipino desirous of learning a trade was admitted without regard to age or previous training. For many months the majority of those who entered left after a few days' attendance. The mastery of the English language and the attainment of qualifications enabling them to secure clerical positions seemed to be the principal objective of the applicants. Other government schools served their purpose better in this respect and really accomplished wonderful results, for, during the few years of American occupation, English has become more generally known than the language of the Spaniard, notwithstanding the three hundred years of the latter's control.

More than half of those who first entered had been rejected by other schools. Some of them were curiosity seekers. At the close of the first term barely a dozen of the original pupils were still in school, and a part of this number were those taking special courses in drawing. It was especially disheartening when it became apparent that school progress in the islands was to be rated by the number on the rolls. Schools for teaching common academic branches were flourishing, and many were established, since such schools needed only small and inexpensive equipments. Normal schools were encouraged because Filipino teachers with proper training were greatly needed. Both of these conditions kept the trade school from attaining the important position it deserved.

At an early date the government had assumed charge of the telegraph lines, but skilled operators could not be secured for all stations. To remedy this a special course in telegraphy was offered by the school. This proved successful from the start, as the class of work appealed to the people and the salaries offered those who qualified were very satisfactory. An American operator gave practical instruction in sending and receiving messages, care of instruments and batteries and simple wiring. Four hours each day, including Saturdays, were devoted to this part of the course, and for two hours a day, five days in the week, instruction was given in English and arithmetic. After a few months' instruction, pupils were graduated in this work to become useful operators for the government. When Secretary Taft visited the islands, in 1905, he called at the school and sent a "message" from one building to another, stating, "I believe that the future prosperity of the Philippine Islands depends, in great part, upon the primary and trade schools."

Just previous to this visit two small kerosene engines had been installed, one in the machine shop and the other in the carpenter shop. Plumbing had attracted so few pupils that it had been temporarily abandoned and machine shop work put in its place. Work in the shops immediately became more popular, as six lathes, a circular saw, a band saw and a planer were added to the equipment of the carpenter shop, and three lathes, an upright drill and a shaper were placed in the machine shop. Twelve portable forges had also been erected and a course in general blacksmithing had been added to the list of trades taught. The work of this shop was very suc-

cessful, although many of the poorer pupils were compelled to work in their bare feet. The school now had about one hundred and fifty pupils, some engaged in the work of the second year, and a few who had been in the school for three years. These pupils represented all classes of society and nearly every province of the islands. Two Chinese youths were earnest and faithful pupils.

As originally planned, all courses required that three hours each day be spent in the shops, with one additional hour for drawing and two hours for academic work. Each successive year the period for shop work was to be lengthened and other periods shortened until, during the fourth and last year, all the time was to be spent in the shops. The unfortunate propensity of the natives for transferring to other schools prevented this plan from being carried out, yet each year the growth of the school was evident. A new system established by the director of education, restricting admission to all schools to certain periods during the year, and a signed transfer from another school to entitle the pupil to entrance, prevented this shifting of pupils from taking place.

There were now thirteen teachers in the school. The teacher of blacksmithing was a former quartermaster's employee who knew his trade thoroughly, but who had never acted as a teacher before. The teacher of machine work was also a practical man, while seven of the remainder of the teaching force were trained teachers from the United States. Of the latter three were women. Four of the teachers were Filipinos who had received most of their training in this trade school. One conducted a class in freehand drawing, another taught wood carving, the third was a very efficient assistant to the teacher of carpentry, while the fourth assisted in mechanical and architectural drawing. The latter was formerly a pupil in the old Spanish trade school. This school occupied a fine large building just outside the city walls in an excellent location. From what could be learned from old records and from the statements of former pupils, this was an industrial school which would rank very favorably with other schools of a similar character in other countries, both in equipment and in the value of courses presented. By comparison, the school of the Americans must have suffered in the minds of the natives, although there was a marked difference in the methods of conducting the schools which was in favor of the Americans. Chief among these was freedom from any cost whatsoever

to the pupil, as opposed to the material and tuition charges of the Spanish. The Americans had fewer restrictions on entering their school. At an early date the Spanish trade school building had been turned over to the Bureau of Printing and therefore was not available for the purposes for which the Spaniards had used it.

In 1905 the Manila Trade School, or Philippine School of Arts and Trades, was reorganized. The class of telegraphy was transferred to the Commercial High School and changes and improvements made whereby it was possible to admit three hundred pupils. Fully ninety per cent of the total number who entered were taking industrial courses, that is, they were studying certain trades which they intended to follow after leaving school. Not only were they instructed in the work of their chosen trade, but they were given as broad a general education as was compatible with the limited time at their disposal and with their individual needs. It was not intended nor expected that the school would graduate journeymen, for it is doubtful if school instruction can ever fully take the place of practical experience, one really supplementing the other. In addition to the work already outlined, an earnest effort was made to inculcate ideas of patriotism and respect for good government. Thus the ideal of the school was to prepare its pupils to become intelligent and progressive workmen, taking a proper pride in their work, with a working knowledge of the rights and duties of good citizenship.

Pupils in those courses which included carpentry, machine shop work, furniture making, wood carving, boat building, plumbing, blacksmithing, mechanical and architectural drawing were required to pass suitable examinations for admission. These were very much the same as are required for admission to a technical high school in the United States. There were no pupils under fourteen years of age and no provision had ever been made for girls in the school. To further assist in the training of pupils of this class, efforts were made to secure practical work for all worthy pupils in the different government shops during the summer vacations. Other courses which were to be added were sign painting and basket work, the latter to include the making of rattan furniture.

For pupils who were qualified, courses in engineering were offered and a class in civil engineering started. Pupils in this class were well grounded in what might be called high school subjects. Theoretical training was given at the school during the morning.

hours and practical work in the afternoons, through the co-operation of the Bureau of Public Lands, where one of the engineers was assigned to look after the interests of the pupils. After the first year a small salary was paid these pupils by the Land Bureau, with a gradual increase at stated periods until the pupil had qualified as an engineer, when he was to receive such salary as his merits warranted. This course has not been in operation long enough to produce definite results.

It was the intention and desire to commence a class in marine engineering as soon as a sufficient number of pupils qualified. Such a course ought to be extremely beneficial, as so many engineers are required for the boats of the harbor and for the ever-increasing fleet of inter-island boats. Possibly this course could have been started if the instruction could have been given in the Spanish language but as matters stood, no such instructors were available, and no pupils applied who could understand English.

A third set of pupils, few in number, came to school to obtain knowledge of some special trade without spending any time on allied subjects. These pupils spent the whole school day in the shops and were admitted without reference to the customary requirements; in fact, few of this class knew a single word of English. They usually remained for a few months only, leaving as soon as they acquired knowledge of some particular part of the work or because of lack of funds. Pupils of this class were usually full-grown men. One man, a former janitor in the school, succeeded in making himself a set of carpenter's tools, and is now earning his living as a woodworker, although he had no previous training or experience. Other former members of the trade school can be found in the shops of Manila, some occupying higher places than they probably deserve, simply because of the lack of skilled Filipino workmen. It was hoped that eventually some of the graduates would establish shops of their own.

Attempts, made at different times, to establish evening classes met with but indifferent response, and it cannot be said that much real good was accomplished in this way.

The buildings, once before referred to, were of inferior construction and generally unfitted for trade school work. Their location near the Philippine Normal School, in a portion of the city difficult of access, was a further drawback. Notwithstanding all

this, the growth of the school demanded additional rooms. Some old sheds were utilized. The pupils of the school boarded in the sides with lumber which they had prepared. The floor was made of sand and some ashes from the blacksmith shop.

Various plans to secure more desirable quarters for the school were not very successful. At one time the City of Manila appropriated thirty thousand dollars for the use of a trade school, and building plans were drawn by the Bureau of Architecture. But the civil government did not do its share by making an appropriation to supplement that of the city, because the acting secretary of public instruction did not think the type of building was good enough. At a later date another set of plans rectifying the first mistakes were presented, but this was likewise rejected. As the commissioner expressed himself, he was highly in favor of industrial education, but he considered that a thorough pacification of the islands was first to be obtained, then an honest and impartial judiciary, and, third, the building of good roads and the promotion of other cheap and efficient means of communication and transportation. Then, after agricultural and industrial pursuits had been encouraged and fostered, the trade schools would easily and naturally follow. All of this seems clear and logical, but rather after the style of the statement that the Filipinos are to secure their independence as soon as they are qualified for self-government. It sounds all right to anyone not particularly interested, but it is rather depressing and unsatisfactory to those who do not care to wait for their children to grow up to do work which they desire to do and feel capable of doing themselves.

The following suggestions might prove of assistance in the solving of the educational problem in the Philippines:

Agricultural schools would probably benefit every part of the country, as some of the staple articles of food, as rice, for example, are not raised in sufficient quantities for home consumption. Climate and soil conditions are such that large crops of the cereal mentioned could easily be raised for local needs and probably for export as well. As each town usually has some special industry, the introduction of technical instruction in that line of work would naturally suggest itself. Investigations into all matters pertaining to the work and conditions governing it would follow. But there are many undeveloped natural resources which could develop by additional instruction in other trades.

The Philippine Islands are noted for the production of abacá, or Manila hemp; yet the manufacture of rope from this fibre is carried on in the crudest possible manner. Other excellent vegetable fibres might be grown with extremely profitable results. In fact, these islands are the center of the countries producing the long vegetable fibres of commerce. It would appear that there are unlimited possibilities in the manufacture of these fibres into twines, ropes and cloth. In other cases hat weaving or possibly pottery work is the chief occupation and perhaps the only one of a large village. It may be carried on, not in factories, but in the homes where each member of the family has a part to perform. In these villages small and inexpensive equipments would suffice, thus leaving the larger and more expensive machinery to be located in central places like Manila and Iloilo, where it would be more especially adaptable and at the same time available for the greatest number.

Few nations surpass the Chinese and Japanese in manual expertness, as it appears in the skilful working of various kinds of material. Personal observation in the homes of both of these peoples has convinced the writer that this ability to fashion industrial products artistically and well is due to very early and practically continuous training. If white races can be trained in the same way and the training be so modified that a judicious mental training be provided while the care-free happiness of childhood is not disturbed, then there will not be so many people who think themselves "sentenced to hard labor for life." With the promises of skill, and the power that comes with it, manual workers will see their work in a different light and they will demand trade training for their children as their rightful heritage.

TECHNICAL EDUCATION AT THE POLYTECHNIC INSTITUTE, BROOKLYN

BY FRED W. ATKINSON,
President.

On every hand is to be found abundant evidence that there is a remarkable public interest in industrial education. This interest is not perfunctory and limited, but widespread and profound. Discussions of this question are reported and criticised in the press as well as from the pulpit and the platform. When the National Society for the Promotion of Industrial Education was organized, among the charter members were public school teachers, college presidents and professors, editors, preachers, judges, manufacturers, bank presidents, wage earners, social workers and others. This great public interest in industrial education as a social and economic force cannot but have a marked influence, not only on the public school system, but on the one hundred and thirty-five departments and schools of technology which exist at present in this country. One of the most valuable results in the movement for industrial education will be the necessity of broadening the test to be applied to every grade of education from the kindergarten to the university. Practical utility as well as the general development of mind and character must be made the test of education. Economic efficiency as well as mental training must be the goal of all our educational workers. This is an economic age, and it is well that education has become an economic question in a sense never so true before.

The Polytechnic Institute of Brooklyn is doing on a small scale, I believe in an effective manner, what institutions like the Massachusetts Institute of Technology and Sibley College are accomplishing so well on a considerably larger scale. Half a century ago, when it offered its first course in civil engineering, there were but six institutions in America providing such a course. Therefore, the Polytechnic may be regarded as a pioneer in the field of engineering education.

Its history as a college is significant in its bearing upon the changes which have taken place during the same period in the

social and industrial conditions of our larger commercial cities. Its curriculum at first, when there were no public high schools, mainly preparatory for college, was enlarged to include two courses of study leading to the degrees of bachelor of science and the bachelor of arts. Later, as a result of its industrial environment, the Polytechnic resolved its science course into courses of applied science, leading to the degrees of civil engineer, electrical engineer, mechanical engineer and bachelor of science in chemistry. In 1893, the number of students in the course in arts and those in the courses of applied science were equally divided. Last year (1907) the number of regular students in the technical courses was eleven times that in arts. The arts course has now been discontinued, and in response to a compelling demand the distinct and definite function of the institute has become the training of men to undertake professional responsibility in the departments of chemistry and engineering. In addition to its regular day courses, the Polytechnic provides parallel courses given in the late afternoons and evenings. Such "extension" courses present to those who are otherwise engaged during the day opportunities for securing thorough and systematic instruction in engineering and chemistry.

Location has determined very materially the development of its courses. Fully fifty per cent of its students are admitted from the high schools of Greater New York, which are among the best in the country. With the greatly increased effectiveness of science instruction and instruction in mathematics and English in our secondary schools in recent years and the introduction of manual training in some form as an integral part of the course of study of both the elementary and secondary schools the conditions for entrance have become unusually high. Recommendations of a student's fitness are always investigated, and this is easily done under the circumstances. The tuition is considerably higher than that demanded by the New York University. It is the desire of the supporters of the Polytechnic that it shall remain a small school which shall make primarily for the highest efficiency, and thus great care is taken in selecting the material. The large city furnishes well-prepared and mature students, although such applicants are apt to average a year older than in most technical schools. The average age of the present entering class is a little over twenty years. This has a very important bearing on the character and duration of the course which

should be given to them. It may be heresy, but I cannot personally advise such men first to take a full college course and then the technical course, but rather the ideal is a five or better, a six years' combined college and technical course.

Metropolitan advantages are an invaluable asset. I might almost say are an absolute necessity to any engineering school. The unparalleled range of engineering practice afforded by New York is not merely an inspiration, but a valuable part of the student's subject matter.

The Polytechnic numbers at present a little less than two hundred students in the regular day courses, and it is the intention of the authorities not to exceed two hundred and fifty. A system of small classes admits of an unusually high grade of work, impossible where great numbers are grouped and submitted to the same educational process. Instruction in the more advanced classes is almost individual. This insures thoroughness, the correction of individual weaknesses and the development of men of power. The rate of advancement under such conditions becomes largely an individual matter. While the courses are mapped out for four years, yet the number taking five years to complete the work is increasing. In a small school, I believe it will be ultimately possible to make the length of the undergraduate course indeterminate. This is true of the course in architecture at the Beaux Arts, Paris, and in a certain sense of the courses offered by the German universities. The satisfaction of formal examinations should not alone determine the candidates' fitness for graduation, but the degree of practical efficiency shown in laboratory and field should be considered.

One peculiarity of our present educational progress lies in the rapid strengthening of the present technical courses. The professional training now needed is in marked contrast to that offered twenty years ago. The industrial world is becoming more complex, more complicated, more confusing. Enormous industries have developed which require a degree of skill, intelligence and knowledge, and a high order of executive ability, which were entirely unnecessary in the day of smaller concerns. The demand for trained leaders has thus rapidly increased. Meantime, the whole problem of higher technical education has changed; technical education, while retaining its form, has broadened. "To-day the school of technology," to quote President Pritchett, "is called upon, not

for a new form of education, but for an adaptation of its curriculum in such measure as to serve the needs of the man and of the engineer." No one questions the value of a thorough technical training, but many do regret that the graduates of colleges of technology are often deficient both in general culture and in those social qualities that make for the highest success. In my judgment, one of the important problems of engineering education to-day is how to give the students a wider culture and how to provide them opportunities for the development of those higher social qualities that make for leadership.

A careful study of the catalogues of a large number of technical institutions and visits to certain representative schools throughout the country show that there is considerable diversity in the courses offered in technology. The last twenty years has witnessed a generous expansion of our technical courses. They are now characterized by greater breadth and variety; and the tendency on every hand is to insist more strongly than heretofore upon culture studies as essential to the engineer and the chemist. A number of technical institutions require that these be obtained before entrance. Fortunately there has been a decided improvement in secondary education in all parts of the country since that celebrated report of the committee of ten appeared more than ten years ago. This advance in the engineering student's previous preparation has undoubtedly tended to lessen somewhat the burden of the higher institution. For instance, it is becoming more and more possible, with the certainty that the instruction will be well done, for the Polytechnic to require that trigonometry and general chemistry be offered for admission. This permits the introduction of qualitative analysis in the freshman year and cuts down the time to be spent in mathematical study. Instruction in the modern languages is being more efficiently performed, and the next cut will come, I believe, in this department. Moreover, promoters of engineering education are beginning to question the relative culture and technical value of extended courses in modern language instruction for the engineer.

The curriculum of the Polytechnic includes, very roughly stated, fifty per cent of strictly technical studies, thirty per cent of studies indirectly technical, as sciences and mathematics, and twenty per cent of culture studies. As a result of its traditions as a college of arts, which it was until recently, as well as a college of engi-

neering, the Polytechnic has always placed great emphasis on the importance of liberalizing study for the engineer and chemist. Like all professional men, engineers should have the broadest outlook, the largest view of men and things. In this belief, the Polytechnic is including in its engineering curriculum this year for the first time brief courses in philosophy, logic and psychology. In adding these subjects to the usual culture studies of English, history, economics and the modern languages, it is attempting, with what success it remains to be determined, to give a breadth of culture that few engineering schools are providing to-day.

The attempt to give a more general cultivation is not at the expense of the theoretical instruction in the mathematical, mechanical and scientific principles, which are the core of every efficient engineering course. Quite the contrary. Greater and greater provision has been made for special as well as for general knowledge. In a certain sense the courses have become more theoretical and less practical. It has been found desirable and possible to reduce the time given to the workshop and the draughting room. An increasingly large number of students are having opportunities for good courses in mechanical drawing and manual training before admission. Situated as the institute is in New York, the students are able usually to secure positions for the long summer vacations, which furnish them with an experience of a practical kind. During the school year there are those who are obliged to earn part of their expenses; these young men have no difficulty in finding occupations more or less closely related to their chosen profession. The majority of the graduates remain in New York and secure positions of responsibility in the municipal departments or in the larger industrial firms. The fundamental requisite of an engineering education which would fit men for executive positions is general culture. Its fundamental characteristic is a thorough training in the theory of engineering operations based on the principles of mathematics and science.

To give this fundamental scholarly training in principles in an illustrative and thorough manner is the chief end of the technical school. However, for technical work knowledge alone is not sufficient without the ability to apply it in any given case. Practice alone leads to a complete conception of truth; it is the higher step of knowledge, of which general scientific knowledge is the first step.

The details of practice can only be taught by experts, and colleges of engineering may appoint a certain number of eminent specialists as consulting professors. Only successful practitioners can present the complex problems of actual practice. From the beginning, the difficulties and conditions of actual service and the application of theory to practice must be made plain to the student. An attempt has been made in the Polytechnic Institute to bridge the gap between professional study and practice by supplementing the work of the regular instructors by lectures, conferences and demonstrations by consulting professors who understand the manifold conditions of actual practice. In this age of continual change and progress, the regular professors cannot be expected to keep closely in touch with all the advances made. These collaborators who have been brought in from the industrial world bring to the teaching and the student body the latest advances in mechanical manipulation and in the application of scientific principles to industry.

The plan of supplementing the regular instruction in a most practical way has worked so successfully in connection with the subjects strictly technical that a broader application of the principle is to be made this year. The regular instruction in our course in municipal government is to be supplemented by a series of twelve lectures to be given by the specialist of the Bureau of Municipal Research upon the actual workings of each of the municipal departments of Greater New York. I have noted with interest that this principle is to be applied extensively in connection with the business course which Harvard University has just opened.

The Polytechnic fails, as does every technical school which does not aim to give to the student a capacity for work, a faculty to do other work of like character, broader intellectual horizons, purer ideas of life, greater confidence in his intellect, and a keener appreciation of his moral obligations.

In order that the Polytechnic Institute may benefit not only the favored few who are able to pursue the regular day courses, but the worthy many, and that its equipment of men and machines may do the largest good, it throws open all its facilities in a parallel series of afternoon and evening classes to intelligent and ambitious mechanics and practicing engineers who feel the need of higher study. The Polytechnic has achieved considerable success during the past four years in the service performed by it in this direction. Experi-

ence has demonstrated that these parallel classes can be conducted upon a high level without detriment to the quality of the regular courses. These courses are especially designed to afford men in actual practice opportunities for professional study. There are already this year over three hundred registrations. There are fifty degree-holding students of other institutions who are working for Polytechnic degrees and in addition many others who have partially completed the prescribed courses of technical degree granting schools. This year instruction in forty-four different subjects is offered. The largest enrolment is in the civil engineering subjects. There are fifty-five in water supply, which is given by a prominent New York sanitary engineer, who has been appointed consulting professor; fifty-four in elementary survey; thirty-one in railway curves and earthwork; thirty-eight in theory of structures, and twenty-two in bridge and structural design. In the mechanical engineering department there are twenty-three in steam engineering; twenty in works engineering, and twenty-three in experimental engineering. In the department of physics and electrical engineering the courses are filled to the limit of equipment and efficiency. It is significant that more and more students are entering with the intention of completing the full course for the degree.

These evening technical courses supplement, especially in theory, the work done at Pratt Institute in the applied electricity and steam and machine design courses. Graduates of the engineering courses of Cooper Union, of whom the greater number entering wish civil engineering, desire the work in order to complete their knowledge of survey, structures, bridge design and higher mathematics. As no work in English, modern languages, history and economics is given at Cooper Union, courses in these subjects are well attended. In an enrolment of twenty-two in the course in English composition there are a large proportion of men actually engaged during the day in engineering and chemistry.

The average age of those enrolled in this evening department is twenty-five. It is of interest to note that men from the municipal departments of the five boroughs constitute a good part of the enrolment. Students are drawn from the departments of water, gas and electricity, topographical bureaus, department of water supply, the new public service commission; students from the technical forces of the Brooklyn Rapid Transit and the Interborough Rapid Transit companies, and the larger chemical works.

In many respects this evening work in higher technical education is unique; it is certainly important. It represents the complete utilization of an educational plant. It furnishes an educational opportunity to a rare lot of mature men who know what they want and how to profit by it.

THE WORK OF THE PENNSYLVANIA MUSEUM AND SCHOOL OF INDUSTRIAL ART

BY LESLIE W. MILLER,
Principal of the School of Industrial Art.

Established in 1876 as an expression of an earnest purpose to give effect to the unmistakable lessons of the great exhibition, the Pennsylvania Museum and School of Industrial Art of Philadelphia was among the first institutions in America to proclaim a distinctly industrial aim as the leading motive in all the activities of a museum and school of art. The museum is located at Memorial Hall, in Fairmount Park, and the school is at the northwest corner of Broad and Pine streets, in the city. The collections of the one and the methods of instruction which characterize the other, are ordered entirely with reference to illustrating industrial history and to serving industrial needs. The museum is especially rich in objects of American manufacture and in such things as textiles in which the inspiration and instruction to be derived from them are most directly available for the purposes of the modern workman, while the work of the school has been developed along such practical lines that it is virtually a trade school for most of the more artistic forms of craftsmanship.

During the first few years of its history it was devoted to drawing, painting, modeling and designing, with constant regard, of course, to industrial needs, but without attempting to provide instruction in actual craftsmanship of any kind. The necessity of providing such instruction became apparent, however, very early. Even from the point of view of the designer this was felt to be imperative, as the school has always based its teaching of industrial design on the principle that the character of which all good design is the expression, is workmanlike character, inherent in the processes of production as distinguished from anything that can be imposed upon the workman from the outside. It was in obedience to this call, therefore, that the beginning in the teaching of craftsmanship was made. But this purpose was soon expanded to such an extent that the teaching of any trade that was at all artistic was regarded as

sufficiently worthy and desirable in itself to need no explanation or excuse of this kind; indeed, it may almost be said that the principle stated above has been carried so far that instead of teaching trades for the sake of vitalizing the teaching of design, it now attaches very little importance to any teaching of design that is not directly associated with actual production of some kind. The School of Textile Design and Manufacture, which is the most important of these practical departments, was organized in 1884, and is widely known as the first school of this kind to be established in America. It owes its existence to the efforts of many of the most energetic and influential members of the Philadelphia Textile Association, which was formed in 1882, and which had for one of its most clearly defined objects the promotion of industrial education of a kind that should correspond to the needs of the textile industry already felt to be acute. No school of the kind existed in this country and there were, consequently, neither precedents for organization nor trained instructors available. The manufacturers knew only that they were being beaten in their own home markets, protective tariff and all, and they realized that nothing would save them but the cultivation here at home of the kind of skill on which the success of their European rivals depended. This meant that the spirit in which the work was undertaken was intensely practical, and that whatever the school was to accomplish was to be along the line of turning out men who could actually do good work. That its efforts in this direction have been highly successful the long list of men in important positions which is published in the school circular every year furnishes the most convincing evidence.

The initiative in the whole movement—and this means the inauguration of practical industrial education in America—was taken by Mr. Theodore C. Search, who was president of the Textile Association at that time, as well as vice-president and chairman of the committee on instruction of the Pennsylvania Museum and School of Industrial Art, of which institution he has been president since 1898. Mr. Search assumed at first the entire financial responsibility for organizing and equipping the textile school as a department of the School of Industrial Art. To his devoted and untiring service in its behalf from the first inception to its present high state of development, more than to all other agencies combined, its success is due.

In this textile work the distinction between technical education and trade instruction, which it is often important to observe, is lost or ignored almost entirely. In textile production all the processes that formerly demanded a considerable degree of hand skill are now performed by machinery, and all educational effort in developing higher efficiency, whatever the grade, must be directed to the cultivation of industrial intelligence rather than manual dexterity. As already noted, however, the school bases all theoretical instruction on practical experience, and believes that the things that are really essential in the mastery of any craft are best learned through, or at least in connection with, a good deal of practice in the craft itself, carried on as nearly as possible in the ways that obtain in actual industrial establishments. To this end the mechanical laboratories of the school are equipped, not with working models, as is often the case in Europe, but with full size machines and appliances, by means of which work of commercial size may be produced and the real problems of mill administration and direction faced at first hand.

What has been done in this way for the textile trade the school aims to do, as far as possible, for such other industries as pottery, stained glass, architectural modeling, architectural drawing, ornamental wrought iron work, interior decoration, woodwork and carving, bookbinding, ornamental leather, and indeed almost all forms of craftsmanship in which the artistic aim is at all prominent. With trade instruction proper, considered apart from its relation to the industrial arts, the institution has, of course, not much to do, as its objects are first and always the promotion of artistic things. Its experience ought, however, to count for something in the solution of the main problems with which the whole proposition of instruction in trades is confronted. I think it has done enough to show that instruction cannot be at once thorough in the cultivation of its own particular field, and devote, at the same time, a large part of its energy to something else.

There are those who seem to feel that the work of the trade school should be, at most, a sort of adjunct, or annex, to the general scheme of culture diffusion and citizenship promotion which has furnished thus far the controlling influence in shaping our whole educational policy, whether public or private. There are those also whose interest in the subject is inseparable from the conviction that

nobody can be taught anything worth knowing, in the trades or anywhere else, who has not first been taught a lot of other things that have long constituted the stock in trade of the scholar as such and which refuse, therefore, to be separated, in this class of mind, from any form of effort that is associated with the school. To the extent that either of these convictions controls the movement, industrial education becomes a tail to the high school kite and nothing else, and it is just because this same kite is already out of sight in the clouds of the impracticable that the demand for something better is so insistent.

The School of Industrial Art does not undertake to teach any branches of general education, either English, or classical, or scientific, except those which find their immediate application in the school itself. It provides in the textile school an excellent course in chemistry, because a knowledge of this branch is indispensable to the man who would master that industry, and because the subject can be taught in direct association with such practical applications as dyeing, bleaching, etc., and in the art school, history is studied from the point of view of the designer, who is continually called upon to work in the styles of great historical periods and for whom it is highly desirable that these periods should be something more than names.

With these exceptions, the courses are strictly confined to artistic and technical subjects. Pupils must be at least sixteen and must pass an entrance examination exacting enough to show that their minds are as mature as they can reasonably be expected to be at that age, and that they have some aptitude for the work of the school and some seriousness of purpose in taking it up. Of formal lists of questions to be answered there is nothing at all.

The organization comprises two departments, the School of Applied Art and the Philadelphia Textile School, each of which offers several courses. In the School of Applied Art these courses, which usually require four years for their completion, are as follows:

1. A regular course in industrial drawing, painting and modeling.
2. A normal art course, covering most of the ground of the regular course, but including also work in all those forms of craftsmanship which are available for use in common schools, and which

have come to be very generally regarded as belonging to the province of the teacher of drawing.

3. A course in interior decoration.
4. A course in applied design.
5. A course in illustration.

Special students are freely admitted to any of these courses as well as to the classes in craftsmanship already enumerated. As a matter of fact, the number of those who graduate from any of them is comparatively small. The vast majority of students have some special aim, or develop some ability, that leads to profitable employment, the call of which is far stronger than the desire to possess the school's diploma.

In the textile school the case is somewhat different, and with the students of this department graduation, relatively, counts for considerably more. It offers the following courses, each of which requires three years: (1) A regular course, covering all branches of textile manufacture in cotton, wool, worsted and silk. (2) A course in chemistry and dyeing, covering not only the work of the practical dyer, but the manufacture of modern dyestuffs and in general whatever is required to fit the student to fill the position of chemist in textile establishments. It also offers the following two-year courses:

3. A course in cotton manufacture.
4. A course in wool and worsted manufacture.
5. A course in silk manufacture.
6. A course devoted to yarn manufacture, covering all matters pertaining to stock selection, spinning, dyeing, etc., but not including weaving.
7. A course in Jacquard design.

Each of these subjects is approached and treated from the practical side, and through the generous co-operation of local manufacturers the machinery with which the school is equipped is in almost constant operation instead of being, as is often the case, a model for the demonstration of a principle which the student learns in theory, perhaps, but not in practice.

Like nearly all the schools with a similar purpose whose history I have investigated, either in Europe or America, the Pennsylvania Museum and School of Industrial Art was established by private initiative and received no public support of any kind until it had

amply demonstrated its usefulness. The museum in Memorial Hall was opened in May, 1877, and the school was opened during the following December in temporary quarters at Broad and Vine streets, in the building since known as Industrial Hall. It was removed in 1879 to the rooms of the Franklin Institute, 15 South Seventh street, and again in 1880 to 1709 Chestnut street. In 1887 it was removed to 1336 Spring Garden and in 1893 to its present location at Broad and Pine streets.

During the first ten years of its existence the school was supported entirely by the dues of subscribing members, the gifts of public-spirited individuals and the funds raised in various ways by the trustees and an untiring associate committee of women, supplemented by a very small endowment and the always insignificant amount derived from tuition fees. In 1887 the state legislature made an appropriation of \$5,000 a year, which amount has been gradually increased with the growth of the school until it now amounts to \$50,000. Since 1881 the City of Philadelphia has also granted, through the park commission, some support for the museum in Memorial Hall, and since 1896 it has made direct appropriations to the school—amounting at present to \$25,000 a year—and has provided through the board of education for a system of free scholarships for pupils of the public schools.

The school is for both sexes. It maintains both day and evening classes. It has a staff of thirty-nine instructors, and its enrolment amounts to a little over 1,000. The work in which it was so early a leader is still in the first stages of its development, but it has already accomplished enough to demonstrate the utility of an education that concerns itself entirely with practical aims. It can point to nearly 1,500 former pupils who have achieved positions in the industrial world, more or less distinguished, but always honorable because helpful. The school certainly has produced upon the life of this, the typical industrial city of America, an impression as beneficent as it is profound.

THE BEREAN SCHOOL OF PHILADELPHIA AND THE INDUSTRIAL EFFICIENCY OF THE NEGRO

BY REV. MATTHEW ANDERSON, D.D.,
Principal.

The industrial development of this country dates from the year eighteen hundred and sixty-two. Prior to that date the United States did but little towards the development of its great natural resources. Until then the thought which absorbed the mind of the nation was the unification of its heterogeneous peoples into one composite body politic: the great battles which were being waged over the political issues; the perplexing questions relative to the adjustment of the Indian reservations, and the anti-slavery agitations, which culminated in the emancipation of four million Negroes by Abraham Lincoln.

Prior to the year eighteen hundred and sixty-two there were not more than six schools in the entire country set apart for the manual and industrial training of American youth, and these few were of such a highly technical character and the expenses of attendance on them so great that it is quite evident that the founders had only in mind the more favored classes, boys whose fathers could afford to pay well for their education.

The poor white boy and girl, and even more the poor Negro boy and girl, were not considered as possible aspirants to these schools. Yet it is from their ranks eventually, rather than from the rich, that the country must hope to secure its defence in times of danger and peril. It is from the ranks of the poor boys on the farm, and in towns and cities, as well as from the ranks of Negro boys down in the canebrakes and rice swamps, on the cotton plantations and in the pitch tar camps of the South, that this country must hope to find the future men to fell its forests, till its soil, fire its engines, drive its locomotives, direct its industries and conduct the machinery of state. Notwithstanding this fact, the country has been slow to awake to a realization of its opportunity. It has been slow to see that by making liberal provisions for the manual and industrial training of its youth, irrespective of

denomination or race, it would increase its own effectiveness and power.

Manual and industrial training as a system of instruction was not heartily received at first in this country, because the system was not clearly understood. Especially was this true among the colored people, by whom it was thought that the system was intended only for them, in contradistinction to the higher or mental instruction which was to be confined to the whites. They said, and rightly, that there should be no class instruction in this country. That we are but one people, and that every attempt to set up a different standard of moral, religious, political, educational or of social life, for any of the peoples which make up the body politic of this great nation, whether they be Jew or Gentile, Mongolian or Greek, Scandinavian or Italian, English or French, Scotch or Negro, should be openly resented.

But the colored people are now looking at manual training from an entirely different viewpoint. They find that it means everything to them as a people. They see that manual and industrial training is that system of instruction which will put into the Negro's hands the weapons by which he in common with his white fellow-citizens will be enabled to conquer the forces of nature and make them subservient to his will. He sees that if he would have an honorable part in the development of the great natural resources of this country, which as yet are hardly touched, he should know how to handle the secret forces of nature and make them assist him, as they are assisting his brother in white, in securing for himself and his posterity these priceless treasures.

The Negro sees more. He sees that manual training is not divorced from or a substitute for the higher training, but that it is a complement of it. That its relation to the higher or intellectual training is as intimate as body and mind, that one cannot exist without the other, any more than that mind in the flesh could exist unless it was connected with a living, organic, puissant body. Therefore, if manual training is taught aright, it should always be in connection with mental studies, not that there necessarily should be the extraction of Greek roots or the conjugation of Latin verbs, but such mental studies as will have a natural bearing upon and connection with the manual studies which are being pursued.

I have just said that manual and industrial training was not

readily received at first, especially by the colored people, because it was not clearly understood. It remained for that noble, God-fearing man, General Samuel Chapman Armstrong, the founder and apostle of manual training in this country, and his most distinguished pupil, Dr. Booker T. Washington, to explain and popularize this system of training throughout this country. As a result, the six schools which existed in eighteen hundred and sixty-two have increased a thousandfold within the last forty years, so that there is hardly a town in the country which has not in some form its manual training and industrial school, ranging from a school consisting simply of a single class in plain sewing and dressmaking, or caning, to the great manual training and technical schools, such as are in Pittsburgh and Philadelphia, founded by Messrs. Carnegie and Drexel, and the University of Pennsylvania. Consequently, the industries of this country have amazingly increased, and the United States has reached a prowess by which she excites the envy and admiration of the world.

I have been asked to speak of the industrial efficiency of the colored people and the influence of industrial education on the efficiency and character of the students of the Berean Manual Training and Industrial School. I have shown that the colored people of this country are now gladly receiving manual and industrial training because they regard it as being the strong arm which will break from them the fetters of physical tyranny and oppression.

But it would be cruel to set before a starving man a sumptuous feast and not allow him to taste any of the viands, especially if he were able to masticate and digest the food and had the perfect use of all the functions of his body. It would be infinitely more cruel if, after a man has been educated mentally and manually, and is made to see and to feel the advantages of his superior knowledge and skill, he were not permitted to make use of his abilities. The colored man has awakened to the fact that manual and industrial training will give him superior advantages, that he will be worth more to his employer, be he a mixer of mortar or a mixer of paint, a servant in his home or a clerk in his business, than he would be if he were not thus trained. But up to the present only the more humble positions, such as those in ordinary day labor and waiting have been open to the colored man. Except in a few honorable cases, the door of hope seems for the time being closed against him.

Would that this country and the leaders of our great commercial interests could be made to see the golden opportunity that presents itself to them. Twelve millions of people are a mighty host! If this people be organized and wisely led and be suffered to enter the door of hope; if they be permitted to employ their minds and skill to the full extent of their ability, it would prove one of the mightiest forces in the development of this country. The colored man is a safe man. He is a man of peace, and he is patriotic. He is proud of his country, and he is ever ready to defend its flag, as he has proven in every war. Never once has he been recreant to his trust. The colored people are here, and here to stay. They are here as a mighty reserve force to be used in some great crisis in the nation's history. There have been times when it was thought that certain valuable products, such as coal, petroleum oil and minerals would become extinct, within a given time, if the present rate of consumption be kept up. But long years before the time expired which had been so accurately calculated, new and more productive veins of coal were discovered, purer and more abundant supplies of oil were found, richer veins of ore opened up, so that the supply is practically inexhaustible. Twenty years ago the Negro, too, was said to be dying out, that it would only be a question of time when he would become extinct. But it is found out that he must have discovered new recuperative powers, for, instead of dying out, he has added at least three millions to his number.

The Almighty Ruler of the universe has made no mistake in regard to the colored people of this country. You and I may not be able to interpret His handwriting, but we know enough, which, if we would but follow and obey, this country would soon be made to blossom as the rose. Nothing is clearer than that it is His will that these millions of American Negroes, who are thirsting for the light of knowledge and wisdom, and who are feverishly anxious to assist in making this country one of the greatest and grandest on which the sun has ever shone, should be given every encouragement in their efforts for self-government and the fullest freedom to put into operation their desire to assist in developing the great natural resources of this country.

It is because I believe in the just purposes of my people, and in the righteousness of the American people, that I have been

willing, aside from being the pastor of a church and congregation, to give a goodly portion of my time in assisting the colored people in the City of Philadelphia along economic and educational lines. This leads me to speak a word on the efficiency and character of the students of the Berean Manual Training and Industrial School.

The Berean school, or the Berean enterprise, as we are wont to call it, is unique because of its peculiar development. No thought of founding a school was entertained when a number of little tots were gathered together over twenty-five years ago and a kindergarten teacher employed to teach them. That teacher has been teaching ever since, and some of the brightest and most energetic young men and women in the city received their first instruction in this school.

Neither was there a school in mind when, on February 12th, eighteen hundred and eighty-eight, the Berean Building and Loan Association was organized. There was not the least thought that it would have such a far-reaching influence. Commencing with an enrolment of less than fifty members, we have now an enrolment of over seven hundred members. Commencing with less than fifty shares of stock, we are now carrying over twenty-seven hundred shares of stock. The assets the first year were but \$5,119; the assets now are over one hundred and fifty thousand dollars. When the association was organized, in 1888, not a single member owned a foot of land. We now have two hundred members who own their own homes, which have an average valuation of two thousand dollars, or an aggregated valuation of four hundred thousand dollars. All of these homes were purchased through the association.

Neither was a school thought of when, in eighteen hundred and eighty-seven, some idle but promising lads were gathered and a teacher employed to instruct them in chair caning. But it was from that class of boys that the Berean Manual Training and Industrial School was evolved. On the 6th of November, eighteen hundred and ninety-nine, a number of gentlemen met in the administration room of Witherspoon Hall. Among them were Mr. John H. Converse, Judge Ashman, H. La Barre Jayne, H. L. Phillips, D.D., John B. Reeve, D.D., and Matthew Anderson. They there organized the Berean School. From twenty-five scholars, which were at first enrolled, the school has now an enrolment of over three hundred. From four teachers there are now sixteen. At first housed in temporary quarters in the basement of the Berean Presbyterian

Church, the school now owns and occupies property valued at fifty thousand dollars. The Berean School is practically a trades school.

The thought in mind on the founding of the school was simply to assist, at night, young men and women who were at work during the day, in simple studies, such as reading, writing and arithmetic, and in two or three simple handicrafts, such as plain sewing, dress-making and cooking. We have now classes in carpentry, upholstery, millinery, plain sewing, shirtwaist making, practical electricity, tailoring, typewriting and stenography, bookkeeping, cooking and waiting, and classes in English studies.

The school is principally held at night, from 7.45 to 10 o'clock. The students come from all over the city and from out of the city as far as twenty-five miles. They come, for example, from Wilmington, Del., and from Chester, Ridley Park, Kennett Square, Bryn Mawr, Cynwyd, Wyncote, Frankford and Germantown, Penna., and from Woodbury, Camden, Merchantville, Paulsborough and Riverton, N. J. There is no school where the students show greater earnestness, nor where they make a greater sacrifice. For, when it is remembered that all the students are at work during the day and come to school two nights in the week and are in class from 8 to 10 o'clock, after which they go to their homes—many of them must go from ten to twenty-five miles, and cannot reach home before half-past eleven or twelve o'clock at night—their earnest and self-sacrificing spirit can be more fully appreciated.

On the 31st of last December one of my students came to me and said: "Dr. Anderson, I want to fill out a blank for my wife to join the English department and to pay for her tuition. Please give me a receipt, as I wish to make her a New Year's present in the morning by handing her the receipt." That man and his wife are now coming regularly to the school twice a week at night. He is fifty and she is forty years of age. At the same time he is assisting a son through a medical college. This is only one of the many noble examples of self-sacrificing effort which might be mentioned.

The Berean School has been seriously handicapped by want of proper buildings, equipment and funds to meet its running expenses. If we had these, instead of three hundred students we would have not less than five or six hundred. Particularly during the last two years have we been very much overcrowded and, there-

fore, very much hampered in doing our work. The desire for knowledge of the trades is growing among our people. A great awakening is taking place. So pressing became the need for space last year that one of our board members was authorized to secure a loan and to finance the erection of a new building and to leave it to me to raise the money and pay off the loan later. The general structure of that building is now finished. It is a three and a half story brick structure, very attractive in appearance and substantial in construction. The basement and the first and second floors will accommodate the principal industrial departments of the school, while the third floor is to be fitted up as a first-class gymnasium. When divided up into classrooms and provided with the latest equipment for manual training work, this will be one of the finest buildings of its kind in the city. To make the building complete will cost nearly thirty thousand dollars. Of this amount we have in hand only twelve thousand dollars. The rest must be raised by voluntary contributions from friends.

The school has purchased three dwellings immediately adjoining its present property for twenty-one thousand six hundred dollars, against which there is a mortgage of ten thousand dollars. Twenty-five thousand dollars would enable us to lift this mortgage and complete the present new building, including the furnishing of the same. I have said nothing about an endowment for the work. I am sorry that the school has no endowment. The running expenses amount to ten thousand dollars a year. Most of this money has to be raised by subscriptions.

The Berean School is the only school of the kind in the City of Philadelphia, where the colored population is estimated to be from eighty to a hundred thousand. This does not include the colored people in the suburban towns. Including the suburban towns within a radius of twenty-five miles, from which students to the Berean School are now coming, there are not less than one hundred and twenty-five thousand colored people, and they are increasing every year by the immigration of thousands from the South. They are coming from the schools and colleges of that Southland; they are coming from the rice swamps and canebrakes; they are coming from the cotton fields and pine forests; they are coming from prison cells and chain gangs; they are coming from every class of Negroes in the South, with the hope of bettering their condition; with the

hope of commencing life anew ; with the hope of escaping the law. This is a serious problem, and we should not close our eyes against it. We must bravely meet the conditions as we have met the conditions in every great emergency in the past, and convert into a blessing that which at present may seem a curse.

With the suburban towns, Philadelphia is practically the largest city in the country in point of colored population. The Negro is here and is here to stay. All the solutions to the so-called race problem which do not take this fact into consideration are foolish and will fail. Now, therefore, since he is here to stay, why not aid him in his preparation to live here in the midst of your civilization? True statesmanship will not leave him ignorant so as to become a menace to the homes and firesides of the nation. True statesmanship will not look forward to the Negro as a perpetual ward of the nation. True statesmanship will throw open the door of opportunity to him, will aid him in his rise to greatness and will be satisfied with the Negro as nothing less than a potent factor in the promotion of the highest interests of this country.

Science is constantly bringing to the attention of man forces and agents which were not thought of or were considered worthless yesterday. Our streets are lighted with a flash of lightning ; we hold audible and intelligent converse with each other miles apart. The navies and merchantmen of the world on widely different seas communicate with each other and with their home governments as freely and as intelligently as men do on land ; the clay under our feet, which was considered of little or no value yesterday, is yielding up treasures more valuable than gold and precious jewels to-day. The thing that was despised and rejected yesterday is honored and esteemed to-day. The vessel which was cast aside as worthless yesterday is placed in our parlors and classed among our most choice bric-a-brac to-day.

Just so the Negro, who is despised, jeered at and neglected to-day, will be received and valued to-morrow, because it will be seen that he possesses that which the world needs and the church must have for its preservation and the consummation of the greatest good.

THE INDUSTRIAL TRAINING OF WOMEN

BY FLORENCE M. MARSHALL,

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In the development of industry the most radical changes that have been wrought are those which have to do with the place and methods of production, and these changes have their greatest significance in the field of education, making the plea for industrial training one of the strongest pleas of our modern educational system. While the concentration of production and the principle of subdivision of labor have meant a manifold increase in the amount of product, they have brought incalculable harm to the producer. We have been suddenly aroused to the fact that industry is on a very unstable basis if this deterioration of producer goes on, and we are beginning also to take the still larger view and to see that civilization itself is on an unstable basis, if human beings are to be sacrificed to things.

If we see the need of industrial training solely from the standpoint of maintaining our industrial supremacy as a nation, then the all-important emphasis must be placed on the training of men that they may attain greater industrial skill and intelligence—but if we look at the subject from the viewpoint of the larger needs of our civilization, then the industrial training of women is of equal importance with that of men, if not indeed of greater importance. In no one of the great educational institutions has there been so significant a change as in the home, and this has affected woman far more than man.

One cannot look back into the history of civilization without seeing that the modern woman at work in industry is by no means an interloper, but that she is doing under adverse conditions of present times what her feminine ancestors conceived, developed and saw taken away from them. The "sphere" of woman's activity has changed from the home to the factory, and the necessity which formerly prompted her to create has changed to the necessity which now prompts her to earn, that she may buy what is already created. This complication of home and industry makes the task of those

who are dealing with woman's training a peculiarly difficult one. No one contradicts the claim that the ideal of education for men is training for citizenship, and one would be considered altogether impractical if he asserted that in giving a boy training to be a first-class lawyer, a first-class mechanic, or a first-class bootblack, he was conflicting in any way with this ideal. It is easy to see that this ideal must come through definite training for a profession or trade in accord with his tastes and needs, one which will develop in him those qualities of heart and mind which the state demands of its citizens.

Citizenship as expressed in an intelligent care of the home is the ideal for the girl. May not it, too, be reached by training her for some definite work in accord with her needs and her tastes, and so develop in her those qualities of womanhood which society requires? As a boy reaches the ideal of citizenship in thousands of different ways and through a multitude of activities, so, too, a girl must reach the ideal through the variety of opportunities which life presents. We shall have better homes when every woman is trained to be a thoroughly competent teacher, designer, dressmaker, cook or what not, just as we shall have a better state and nation when every man is trained to be a thoroughly competent doctor, mechanic, barber or bootblack, because, through this training, habits of industry and definite aims and purposes will be developed which will make a finer type of character in both man and woman.

Industrial training for men has come to be a recognized need, and the field of its application is as broad as the world. On the other hand, while industrial training for women in so far as it is applied to the obvious activities of the home is hailed with delight, any specific training to place girls in skilled trades has at present more enemies than friends. "Women ought not to be in factories and workshops; they ought to be in their homes," too often dismisses the subject, as if that settled the whole question. For us who are women and who work with women, the matter is not so easily adjusted, for we realize that, regardless of what ought to be, existing conditions make such a state of things far from possible.

The term "industrial education for women" is used indiscriminately to refer to training for the varied activities of the home and to specialized training for some particular industry. While in a broad sense both are industrial, the two phases are quite distinct

and must be approached in quite different ways. It is in the narrow sense, the sense of training for a definite trade, that I shall attempt to discuss the subject, and in doing so I shall try to show that such training is of the utmost importance from the standpoint of both industry and home.

What are some of the facts about women for whom the demand for trade training is being made? In most of our states the law requires all children to be in school until they are fourteen years of age. We have no statistics which give us information about girls between fourteen and sixteen years of age, but we know from scattered reports of various schools that in all large manufacturing centers only a very small percentage of girls remain in school after the compulsory attendance is completed. We have, however, figures which show that in many of the largest cities from fifty to seventy-nine per cent of women between the ages of sixteen and twenty are employed in gainful occupations outside the home. This number would be greatly increased if our figures included the fourteen- to sixteen-year-old girls who are not in school, but who are drifting about from one unskilled occupation to another. These are the women to whom our schools are not appealing. These are the women who are flooding our industries with unskilled, uninterested, unthoughtful labor, and these are the women who are to be the mistresses of our future homes. What are these women meaning to the industries and of what significance is their training?

Of the three hundred and three industries classified in our national census women are found to be employed in all but two. It might seem at first glance that the field of opportunity for women is widening. However, an intensive study of the industries would show that these opportunities are more apparent than real. While women are being admitted to a larger variety of industries, the minute subdivision of processes in all kinds of work really means that they are employed more and more in the unskilled occupations which have now become a part of all industries. It is a widening of woman's territory without giving her greater opportunity for advancement. In many of the large factories women become the packers and sorters. In the mills they are doffers and spinners. In the shoe and glove industry they stitch, glue, sew on buttons and perform various other semi-skilled processes. But we do not find them as lasters or cutters of shoes. We do not find them as designers

or drawers-in in the mills. We do not find them in the skilled work even in our factories which deal with confectionery and numerous other food products. They are having a greater number of chances to work, but fewer chances to become truly skilful workers.

It is, therefore, important to keep in mind these changes in women's occupations which have been brought about by the evolution of industry in order to discover the significance of training. First: what is the lack of training meaning to skilled industries? Take, for example, the dressmaking trade. What effect has the untrained work of women upon that trade? Statistics are not needed to prove that the standard of our product is not as high as it ought to be. Our stores are flooded with garments poorly made, poorly designed and showing altogether a lack of understanding regarding materials, color combinations and fitness. The ability to originate is not found among our workers, so that practically all of our models in the great clothing industries are brought from foreign countries, where much emphasis is laid on training. This must mean that such industries are maintained at an excessive expense. Then, too, to secure workers in these skilled trades entails a constant economic waste. Many who might be most valuable are never known to the industry because they have never had the opportunity to discover their own talents. Trained workers would be of immense profit to the industry, while now the endeavor to discover good workers and the cost of training those who seek entrance to the trade, regardless of fitness, result in a serious loss. If women were trained for these industries, we should have a higher standard of product, a better supply of labor, a lessening of expense in the cost of production, and an ability to pay fairer wages and to sell at more reasonable figures.

The untrained status of women has, too, its bad effect upon industries where the introduction of machinery has brought about a very great division of processes and where production is conducted on a large scale. Many such industries are in themselves skilled, but contain numerous occupations which require little training to perform what may be called a semi-skilled process. The effect upon the industry of such semi-skilled workers is shown by a steady shifting of employees and a constant breaking in of new workers, resulting in an economic waste. Moreover, a girl, not knowing the relation of her particular task to other parts of the work, per-

forms it in a disinterested and usually unintelligent manner, sometimes incurring heavy financial losses, in the way of damage to materials and machinery. A mill owner once said to me, "A girl who was trained to do her work would know better than to leave a pin in her cloth while weaving, which means hundreds of dollars' damage to a piece of delicate machinery."

In such industries as the shoe and glove industry, where the skilled work is done by men, and where the standard of product is dependent upon their efforts, the effect of untrained women workers in semi-skilled occupations is not so marked, but in the manufacture of clothing, which is primarily dependent upon the taste and originality of women, we shall always have an inferior product unless women are trained.

What is true of the semi-skilled work is true to a more marked degree in industries where processes performed by women are wholly unskilled. Women in unskilled occupations require a large amount of supervision, they take no serious attitude toward their work and no interest in helping to make the industry successful. They are shifting and unstable to a degree which has its effect upon both the amount and kind of product.

It is in connection with these unskilled occupations, where there are many thousands of young girl workers who are thinking of nothing but the few dollars they can earn, that we have one of our most difficult industrial and social problems. It is here that we must place the responsibility for much of woman's unfitness for the home. It is here that we see most clearly what the lack of training means. If we look at any large manufacturing city, the hopelessness of the situation presents itself. In many of our cities more than three-fourths of the girls are receiving no schooling beyond the grammar grades, but are entering factories and workshops with no other thought than to earn enough to supply their immediate needs. Victims as they are of industrial changes which have taken away their chances of development, they are commencing life without any knowledge of its meaning. Girls of the present day know nothing of the necessity to create, which came to their mothers and grandmothers before all the processes of production became a part of the great factory system and the home was supplied with its every need "ready made." Little in their lives is contributing to their industrial sense. If they begin work at the close of their grammar school

period, it cannot be of a nature to require skill and judgment, but must be merely a mechanical repetition of some process—a matter of running errands, tending a machine or some similar occupation, promising nothing in the future.

What is the relation of such an occupation to a girl's future home? It determines first of all her social scale and the type of man she will probably marry. Her companionship is limited to men who, like herself, are unskilled workers or who are of shiftless and irresponsible character; this is not alone because of her grade of occupation, but because of her scale of living.

It too frequently means the undermining of a girl's physical constitution, not always because the occupation in itself is harmful, but more often because she does not know how to approach her work in an intelligent way. Sometimes it is a matter of workroom conditions, which a trained person might help to improve, but often it is a lack of knowledge regarding the needs and care of the body. A willingness to work among unclean surroundings and in bad air, a readiness to eat unwholesome and non-nutritious food, and the necessity of seeking pleasure at night, to counteract the dull monotony of routine work, result in the absolute ruin of many a girl's physical constitution.

The effect of unskilled occupations upon woman's general intellectual development is manifold. The fact that unskilled processes require little or no thought inevitably brings about a deterioration of mind resulting from lack of use. Where there is no incentive to thought there is neither conscious nor unconscious growth, but mental stagnation. It is impossible for a girl to become generally intelligent and efficient if she spends the most formative years of her life amid surroundings which are powerless to arouse her ambitions and which too frequently deaden her finer sensibilities.

Not only are unskilled girl workers stunted in their growth physically and intellectually, but circumstances which make this possible too often result in a still more serious situation. The closed door of opportunity ahead, the wage usually too small to furnish the bare necessities of life and the apathy resulting from monotonous labor prevent the cultivation of any ethical sense, and tend to make girls careless and reckless regarding their moral standards.

These stultifying effects incident to women's employment in unskilled work have their obvious bearing upon the home. The

majority of girls in this walk of life marry and have homes of their own, but what sort of homes can we expect girls to make when the years of preparation have been spent in this fashion? Must we accept the situation as unchangeable? If not, what can be done to better it? Women have always worked. Women must always work if they are to attain their highest and best development. The question is not, shall we keep them out of workshops and factories, but with what training shall we have them enter? Not how shall we strengthen the home under ideal conditions, but how shall we improve it under existing conditions?

We hear much in these days about home training. Its advocates are invading our colleges, our high schools and even our grammar grades, whether rightly or wrongly I cannot say. In general, I believe that every girl ought to have an opportunity to know as much as she cares to know about all subjects pertaining to home management, whether she has but one year or eight to devote to its study. In general, too, I believe that the time to lay the foundation for domestic tastes is in the years between the kindergarten and the high school. But I am not among those who believe that such training, even if offered universally, will be as far-reaching as it should be, nor that it will strike at the root of the difficulty. It would be interesting to discover how schools of this kind would affect the situation in manufacturing centers, where now seventy per cent or more of all the women of high school and college age are at work.

Industrial training for women, if it is to serve its highest and best purpose, should somehow reach the women and girls who do and who must work. It must not deal with them on any sentimental plane of what may or may not be their future; it must deal with them on the plane of their present needs, and, without sacrificing the ideal, train them to do well whatever work they care to undertake. If they can devote but one year to learning something which will admit them to a skilled industry, this opportunity should be given them. It is a gain if the year of training results in acquisition of even the lowest grade of technical skill, for it has given the chance for many an inspiration, and it has helped the girl to take the "next step" intelligently.

Among unskilled women workers there are many who would rank among the highly skilled if they could have had the opportunity

for training in early life. There are, moreover, thousands of girls who are yearly swelling the number of unskilled workers because schools are not fitting them for anything better, while the level of those who, regardless of opportunity, would still be unskilled, would be decidedly raised if they could receive even the minimum of training.

The experience I have had in teaching trades to girls who would otherwise go to work as soon as they could withdraw from public school has strengthened my belief that this training has had a beneficial effect upon the home, although having as its distinct aim preparation for some special trade. It has opened their eyes to the needs of their physical well-being; it has stimulated them to higher ideals of companionship; it has helped them to take keener pleasure in their work and to seek ways of advancement. Moreover, the opportunity to earn a higher wage has increased their self-respect and raised their standard of living. The ability to do well even a minor grade of work has broadened the girl's interest, and has given her a technical efficiency which she can turn to account in the household.

By raising the standard of health, cleanliness and morality, by stimulating interest in learning to do something which requires exercise of the mind, by giving sufficient technical skill to insure opportunities of advancement, and by making possible a wage sufficient to maintain self-respect, that home which most needs attention is being reached—and reached most effectively,

THE RELATIVE VALUE AND COST OF VARIOUS TRADES IN A GIRLS' TRADE SCHOOL

BY MARY SCHENCK WOOLMAN,

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Trade schools, which directly aim to fit young women for specific occupations in which they can support themselves are not numerous in the United States, but a definite movement toward their organization is evident at the present time. There have been many sporadic efforts to understand the industrial conditions under which women work, and the physical and moral effect such work is having upon them, but concerted and comprehensive investigation is greatly needed. Serious study of these subjects is absolutely essential as a preliminary to organizing trade classes in any community, and work begun without such preparation may be positively harmful from the lack of knowledge of the problems involved.

It is true that many schools of a technical or domestic nature have been started to train women, but the instruction in them has been heretofore, for the home or for educational purposes rather than for business. The trades, if they are represented at all in these schools, are general in character covering often many branches of an industry in a short series of lessons, and not with the particular subdivisions and special equipment which are found at present in the regular market. Such schools serve a direct and beneficial purpose, but only indirectly affect the industrial value of the working girl.

In considering "The Relative Value and Cost of Various Trades in a Girls' Trade School," the equipment, budget, curriculum and courses of work in these technical-domestic schools give but a partial view of the subject. Only the real trade school can offer specific suggestions, but these are unfortunately limited in number, and their experience extends back only a few years. The subjects taught in them and the methods of instruction are still, of necessity, in a changing and developing condition.

The data for this article are based upon actual conditions in several schools which deal chiefly with trade needs and endeavor constantly to keep in touch with the industries for which they offer instruction. The deductions, however, must be considered suggestive rather than final, on account of the newness of the work.

Does experience in trade school organization enable one to give a list of good trades for women? Many influences unite in any given locality in settling the industrial opportunities for workers. A trade which is good in one city may be seldom or never found in another, and hence a list of good trades cannot be made for universal application. Even though some occupations seem to be found everywhere, the workroom requirements differ widely and need special consideration. Such a list would, therefore, have to be accompanied by so many important qualifications that, in the end, personal investigation alone could prove that the subject should be taught in the schools of any particular place.

Women and girls are now admitted into the majority of trades in the United States. The conditions of work in many of them are unsatisfactory. In some, the girls pick up odd jobs in which, if they gain speed they can make more or less fair wages, but from which they are not helped to better positions. Wrapping braid, sorting silk, tying fringe, taking out and putting in buttons in a laundry, dipping candy, assorting lamps, and the like, may be mentioned as representative. In still other classes of work they are employed only at inexpert or even menial tasks, all advance being blocked. Instances of such occupations are those in which the bulk of the work requires great physical strength, as in tending massive machinery. In many good trades the future is closed to women, for the reason that the expert work is in the hands of men who are protected by their unions. This is the case, for example, in book-binding, lithography, and parts of the upholstery trade in New York City. The training of women for occupations where their progress is stopped or where they are only allowed to do the inexpert work, with the consequently low wage, is useless. Still again, there are positions which offer a good wage, the demand for workers being greater than the supply, but where there is small chance for advance unless the education and ability are above the average. Clerical work in business houses, in lawyers' offices, or in banks, is an instance of such employment.

Bad physical conditions are found to attend some trades in large cities. Such employments deplete the strength of women, and in many instances lead to immorality. There is danger of this kind when the market demands a cheap article and the workrooms providing it are small, the ceilings low, the rooms overcrowded with workers, the product piled up all about, the demand for inexpert workers large, and the pay small.

Many working girls are already in poor physical condition. Trades which may be harmless to the strong are injurious to them, and unsanitary workrooms are disastrous. In many cities incipient tuberculosis is found. For girls thus affected the continual sitting in a constrained position as in fine sewing; the crowded workrooms; those trades which give off dust, lint or fine particles, and the warm, moist air of a laundry should be avoided. Occupations should be chosen which require standing or moving freely about in good, dry air, as in many forms of delicate pasting and novelty work, or in the work of stock clerks and buyers. Incipient curvature of the spine is found also where the poor are crowded together in tenements and the children are underfed and consequently ænemic. Foot and power machine work and trades requiring the worker to lean for hours over varieties of fine handwork are bad for those whose spines are weak as well as for those whose eyes are affected. Certain other trades, even if they pay well, should be avoided by all women on account of the bad physical reactions which are almost sure to follow. Illustrations of these are work on cut glass, cigar stripping, pearl button making, fur and feather work, and X-ray and many other forms of electrical work, unless guards are provided.

Into such employments as have been mentioned thousands of girls enter. They find each unsatisfactory in turn, and wander into the next in search of something better. They do not become more capable as they proceed, for one experience does not fit them for the next. The director of a trade school must know how the majority of women are employed in her community, even though she rejects most of these occupations from the curriculum of the school, and chooses only those in which there is hope of future advance. In the expert trades themselves she finds discouraging conditions even for the trained workers. The long slack seasons which occur in many otherwise good trades are so serious that a girl often prefers a poorer occupation with steady wage all of the year to such

highly paid, temporary positions. Millinery, machine straw hat making, and many forms of novelty work are instances of such seasonal work. As uncertainties of this kind exist in all industrial communities, each city must, of necessity, determine for itself the advantage of subjects for trade instruction. If poor seasons interfere with a good trade the director must find an allied occupation which is busy when the other is slack, and train each worker for both. Otherwise a girl, even when she is considered capable and is placed in a good position, will find she must yearly go through months of idleness or else wander about in search of something to yield her a small support during the interval in her regular business.

Special industries requiring skilled workers are located in some cities. New York, for instance, is the center of the ready-to-wear clothing trades. The work is highly specialized, ranging from the very simple for the unskilled hands to the most delicate and elaborately decorated for workers of ability and long experience. A school situated here must of necessity prepare for the needs of these numerous workrooms. In other large cities trades of this special character may not be found at all, but occupations of a different kind which also need trained workers may be developed. For instance, corset factories requiring experienced hands on electric power machines; textile and lace manufacture requiring the finest hand sewers, repairers and darners; and passementerie and dress trimming workrooms, where knowledge of the control of the various foreign and domestic embroidery machines is a necessity.

Although it is difficult to enumerate trades which are good in all parts of the United States, general statements may be made of necessary conditions which should be met. Good trades for instruction are those which require expert workers; which employ large numbers of women; which are with difficulty learned in trade workrooms; which pay good wages and offer the chance of continual promotion for better work; which have favorable physical, sanitary and moral conditions in the workrooms; which provide a steady occupation during most of the year, or if seasonal, hold out a prospect to the workers of a possible temporary transfer with fair pay to another allied trade during the slack season.

It can be said in general also that workrooms should be avoided in which the principal object is the cheapest work; in which the

product is in demand and very inexpensive, or where men and girls are working together; in which the workrooms are crowded, dark and unsanitary; in which machines are rapidly taking the place of handwork, and men's trades intervene. Trades that are well organized are generally better than the unorganized. Work in the factory is usually better than is the custom work in the home, for the factory is more apt to observe the laws in regard to light, air, cleanliness, and hours of work.

Still another question which needs thoughtful investigation is the effect the trade school will have on the working people of any community. Oversupplying workers for a trade and thus lowering wages, or training for work which will throw men out of employment while girls step in for less remuneration, and providing workers during a strike, are serious mistakes for a trade school to make if it wishes to help the class which needs help most.

The careful investigation in New York City of all of the above-mentioned conditions resulted in the selection of the following trades for the curriculum of the Manhattan Trade School for Girls, begun November, 1902. To this list general statements of the length of the season of employment and of the wages secured are also added. The need to be self-supporting compels thousands of girls in this city to go to work when the compulsory school years (until the age of fourteen) are over. Those who come to the school can give but a few months or a year at most to preparation. Hence the courses must be short and directly adapted to the needs:

I. Use of electric power sewing machines.

1. General operating—

(Cheaper variety of work—seasonal, fair wages. Better grade of work—year round, fair and good wages piece or week work).

Shirtwaist making.

Children's dressmaking (cloth and cotton).

Boys' waists.

Infants' wear.

Children's underclothing.

Women's underwear.

Fancy petticoats, kimonos and dressing sacques.

2. Special machines—(seasonal to year round work, depending on kind and demand, wages good).

Lace stitch.

Hemstitching.

Buttonhole.

Embroidery (hand and bonnaz).

3. Dressmaking operating—(year round, wages good).
Lingerie.
Fancy waists and suits.
4. Straw sewing—(excellent wages for a short season, but the worker can then return to good wages in general operating).
Women's and men's hats.
- II. Use of the needle and foot-power sewing machines—(seasons nine to eleven months, and fair to good wages).
Uniforms and aprons.
White work and simple white embroidery.
Gymnasium and swimming suits, wholesale and custom.
Lingerie.
Dress embroidery.
Dressmaking, plain and fancy.
Millinery—(short seasonal work, low wages, difficult for the average young worker to rise).
- III. Use of paste and glue.
Sample mounting (virtually year work, fair wages).
Sample bookcovers.
Labeling.
Tissue paper novelties and decorations—(seasonal and year round work, good wages).
Novelty work—(year round work changed within workroom to meet demand, wages good).
Jewelry and silverware casemaking—(year round work, wages good).
- IV. Use of brush and pencil—(year round work, good wages).
Special elementary art trades.
Perforating and stamping.
Costume sketching.
Photograph and slide retouching.

NOTE.—Year round work usually includes a holiday of longer or shorter duration.

At the Manhattan Trade School, besides the trade work, the students must each have art and academic work as a direct part of their trade. Wholesale trade and custom work are taken in all departments to give reality to the instruction, to serve as a basis of true criticism, and to provide materials of the right character upon which to work. The school is open all of the year; students can enter at any time, the only requirements being that they can get working papers, are in fair physical condition, and have a reliable person to introduce them. A large number who enter have not graduated from the public schools, and many have only reached the fifth or sixth grade. While two-year courses are offered, the work is so

planned that those who must support themselves can be prepared for some wage-earning position, even if they can remain but three months. Placement is done by the school through a secretary, who gives her time to this subject.

Five years of experience at this school gives the wages of those who have been placed in trade, and shows first, the tendency of each worker to rise to better positions, and second, the increasing wage at entering the market owing to improved methods of training the workers. This experience also shows that employers of labor appreciate the value of the girl trained at the school.

	Wages upon entering trade.		After 2 to 4 years in trade		Possibilities in the trade
	1903.	1907			establishment.
Dressmaking	\$3 to \$5	\$4 to \$7	\$5 to \$12		\$25 or own establishment.
Millinery	2.50 to 4	3 to 5	4 to 9		12 to 25 or own establishment.
Operating (including straw hat making) ..	3 to 6	4 to 8	5 to 25		15 to 40
Novelty	3 to 5	3 to 6	6 to 10		18 to 25
Trade art		5 to 8	Work organized but a short time.		20 up.

From the table it would seem that in New York City the good worker on electric power machines has the best opportunity for a good wage; dressmaking is next, and novelty work follows closely. Millinery is the lowest and is also the most affected by seasonal occupations. Teaching the skilled use of the needle affects one-fifth of the women employed in this city, and hence it seems essential to offer training in this line.

The study of business conditions has been found to be constantly necessary, the requirements in the New York workrooms varying on account of fashion, labor difficulties, or new mechanical contrivances. Every year the school has dropped something from the curriculum, changed the method of teaching work already established or has added a new subject to the course. Thus knowledge of trade needs is vital.

The Boston Trade School, which began in 1904, two years after the Manhattan Trade School, faces similar problems in being obliged to prepare workers for positions as speedily as possible on account

of their poverty and need to be self-supporting. A study of trade in that city preceded the organization of the instruction and continues to be necessary, as is the case at the Manhattan Trade School.

The following trades are taught in Boston:

Dressmaking: So graded that girls who have not the ability to do very skilful work may specialize in children's clothes, underwear, shirtwaists, or wash dresses. At present this trade offers the greatest demand for trained girls, shows apparently more appreciation of the value of training and offers a higher beginning wage. The workrooms are busy nine or ten months in the year.

Clothing Machine Operating: Dealing with ready-made factory clothing,—aprons, men's shirts, shirtwaists, petticoats, underwear, etc., but not ready-made dresses. This trade constantly demands workers, but does not offer good pay. Girls seeking training are not attracted to it.

Straw Machine Operating: For all kinds of ready-made straw hats. This trade offers excellent wages and a six to eight months' season for a limited number of girls.

Millinery for Custom Trade: Eagerly takes the trained workers and offers good opportunities for advancement. The seasons are short.

It can be seen that these schools, in fitting into the industrial conditions of the two cities which they serve, have variations in their required work and also in the value of the trades selected when placing their students. Although the short time trade school is perhaps the only one where trade conditions are and of necessity must be exactly reproduced in the instruction in order to accomplish specific results in a limited time, there is another class of school which combines trade features with the technical or domestic branches. Institutions of this character offer a longer period of required training, and, therefore, must draw their students from those who can give more time to preparation than can those who are hurried into the business world by the poverty of their parents. An excellent example of this class of instruction is the Hebrew Technical School for Girls in New York City, begun as a Sunday school in 1882, and as a technical day school in 1887. Those who enter are graduates of the public schools. Here the pupils are examined at entrance. Two courses are offered, each being eighteen months in length,—the commercial, comprehending bookkeeping,

stenography, typewriting and business methods; and the manual, which teaches hand and machine sewing, embroidery, millinery and dressmaking. While the scope of this article does not include commercial training, the experience of the capable director of this school as to the importance of this field is worthy of consideration. After twenty years of training girls he says that those who have had a good general education and who can give eighteen months to a further special training will find in the commercial field better opportunities for good wages and steady rise of employment than in the trades. He feels that mental work is less fatiguing than manual, the pay in general is higher, and the office hours are shorter, thus leaving time for improvement. The usual type of New York trade worker who leaves the public school at the first moment the law will allow, and in general from the lower grades, has not sufficient education for this course, and the manual trades alone offer her opportunities. The manual course gives the general training for the home rather than the specific as needed by trade. All students take the same course. Two workrooms, lingerie and dressmaking, are connected with the school, and graduates of the manual course so desiring may obtain employment in them. About one-half of the girls who have graduated from the manual department have sooner or later gone into trade. About one-third of the students are in this department and two-thirds are in the commercial. Academic work and art accompany and strengthen other courses. Effort is made to place in trade those who desire it.

While excellent and more or less trade-like courses are offered at such institutions in Greater New York as Pratt Institute, the Washington Irving High School, and the Young Women's Christian Associations, they throw no more light on the value of trades for girls than has been given already. Most of them are training for the use of the needle in some form, because this tool enters so largely into woman's economic life, whether in trade or in the home.

Distributed over the continent of Europe and adapted to the various nationalities are numerous professional schools for girls with courses ranging from one to five years. The following trades are represented in the various curricula: Garment making for women and children; dressmaking; fine underwear and white work; millinery; artificial flowers; waistcoat making and cloth work; corsets; gloves; embroidery (hand and machine); lace making (hand, pillow,

crochet needle and machine); men's shirt making; fine laundry work; fine darning and hand weaving; and art in many phases, such as costume designing, china and fan painting, textile and other varieties of industrial designing. Hair dressing and manicure work are also found.

In the schools abroad offering several years of instruction, the academic subjects, art, housekeeping, cooking and physical education are usually included. Belgium offers numerous and excellent instances of these schools of four or five years' training and also a few examples of the apprentice school for girls, where a reproduction of trade conditions is found. Many of the foremost women in the regular trade workrooms of Belgium and also those at the head of separate trade establishments are graduates of these schools. A small fee is usually required, although scholarships provide for many of those who are too poor to pay. The local government, societies, trade unions, and private interests help to support these schools. In Belgium the government has entire supervision, and definite requirements must be met by the private as well as by the regular government schools. In these long-time schools the trade features of instruction are less apparent than the technical, and the problem is entirely different from the training for direct trade work.

The question is frequently asked why the trades offered in the foreign trade schools are not given in schools of the United States. In many instances, these occupations are more developed in Europe than with us, or when found in our cities are not of sufficient importance to train many workers for them. If any are found to be developed where there is a trade school, the training for them should be offered. It frequently happens also that the tool required is the same as for other more usual industries. The worker who learns to use her tool in one has little difficulty in changing to another. For instance, an electric power operator trained at a good school can change from fine white work to gloves, corsets or waists with a short practice period. Although the foregoing indicates that specific trades which will suit all schools cannot be found, it can be seen that the needle and sewing machine play a large part in women's employment. Training for the use of these tools is important in girls' trade schools, as well paid work of the greatest skill is frequently required and employers of labor find efficient workers hard to obtain. It will be found though that the branches of the

trades where these tools are used vary in different communities, the popularity among the working class of such trades causes many to elect them who have no capacity for them or who cannot remain in the school long enough to become expert.

The expenses of trade school education, as compared with those of the ordinary school, are large. The special equipment, the skilled instructors, the long hours, the twelve months' courses and the supplies of material are factors in this outlay. The equipment, even though simple, often demands considerable expenditure of money, especially if the various electric operating trades are to be taught. The instructors must have specialized knowledge and skill as well as the ability to teach, but the classes cannot be large when expert processes are involved. The efficient worker, who is a success in her trade workroom, can command an excellent wage. The trade school must compete with this good salary in place of that of the underpaid teacher. Such an institution cannot afford to employ an unsuccessful worker or a teacher who knows nothing of the market to instruct students for industrial positions. The good teacher, who can also succeed in trade, is rare, and when found can command high remuneration.

The equipment in the majority of business workrooms is composed of essentials only, and a school does not need to have more. Much additional money may be spent in expensive furniture and woodwork. The following lists and estimates¹ show the actual needs and necessary expenses in three groups of trades:

Garment or dressmaking.			
Sewing machines, each	\$18.00 to \$70.00		
Work, cutting, and ironing tables, each	6.00 to 20.00 upward		
Electric irons, each	7.75		"
Gas stove (necessary when electric irons are not used), each	2.00		"
Cheval glass, each	20.00 to 100.00		"
Chairs, each .....	.50 to 3.00		
Exhibition cases, stock closets, cabinets and chests of drawers, each	10.00 to 100.00		"
Fitting stands, each	2.00 to 30.00		"
Fitting room (a curtained alcove).....	10.00		"
(a furnished room)	100.00		"
Dress forms, per dozen	30.00		"
Waist forms, per dozen	6.00		"
Sleeve forms, per pair	1.00 to 1.50		"
Lockers, per running foot	3.00 to 8.00		"

¹Retail prices are quoted.

A room for twenty workers may be plainly furnished at a cost of \$300 to \$500. If a large number of expensive sewing machines are desired the estimate must be increased by several hundred dollars. The equipping of a workroom for electric power operating, including general and special machines, motor, cutting and work tables, cabinets and chairs, will be considerably more expensive than the one for garment making. In the latter, one sewing machine can be used by several workers, but in electric operating each worker must have her own machine. The electric motor adds also to the expense. The minimum cost of equipping a shop for twenty workers would be \$1,000 to \$1,500.

The necessary equipment would be:

Plain sewing machines in rows, per head	\$22.50	upward
Troughs for work between the rows and tables for the machines, per two machines.....	10.00	"
Special machines (two needle, embroidery, lace stitch, buttonhole, straw sewing, and the like), each according to kind	35.00 to 150.00	
Motor, each	140.00	"
Cabinets, tables, chairs and irons as above.		

In workrooms conducting trades which use paste, gum and glue, the following special equipment is required:

Glue pots (gas), each	\$7.50	upward
(electric), each	21.75	"
Hand cutter, each	50.00	"

Special machines for cutting large quantities of cloth, for perforating designs or for pleating materials are often needed in teaching the garment trades. Typewriters, mimeograph machines, electric clocks, and up-to-date business devices will be required also in a school of any size or pretension. Wholesale prices can usually be obtained when the order is large. Dealers have also shown themselves willing to sell their machines at low prices, to loan them, and even to give them to a school which has proved its ability to train good workers.

The cost of housing, the equipment and the annual expense of a school depend on many factors, among which may be mentioned the kind of trades taught and the class of building to be maintained. The annual expenses per pupil will range from \$75 to \$175. The

per capita expense in trade schools for boys will go much higher. The three schools whose courses of work have been mentioned already have furnished data on these items. They are all private schools, with no connection with the public instruction of their cities. They charge no fees and are open for instruction for eight hours a day all the year round. They are all giving special attention to the health of each student by the aid of specialists and by some form of practical cooking and study of proper foods.

The Hebrew Technical School for Girls, with 381 students, has lately built and equipped an ideal building for its work at an expense of \$382,000. Of this amount, the land cost \$132,500, the building \$215,000, the swimming pool \$22,000, and the equipment \$12,000. The annual expense of running is a little over \$40,000, which includes teachers' salaries, \$23,500; office salaries, \$3,500; maintenance, \$12,000; and printing and stationery, \$1,200.

The Boston Trade School, which has 171 students, is housed in two adjoining dwelling houses, with a rental of \$1,400 per annum. The equipment in furniture and machines cost \$2,800. The annual expense of running is \$14,500, of which sum teachers' salaries constitute \$9,500, the administrative salaries \$2,000, and the maintenance \$3,000.

The first home of the Manhattan Trade School was a large four-story and basement dwelling house, for which a rental of \$2,100 per annum was paid. The initial equipment provided for 150 students and cost \$9,500. The school quickly outgrew its quarters and bought a large business loft building at an expense of \$175,000. The former equipment was used and \$5,000 spent in addition for furniture and sewing machines. The number of students from July, 1907, to July, 1908, was 470. The annual expense of running is \$36,000, of which the salaries for teachers are \$20,000, for administration \$6,000, and maintenance \$10,000.

Both the Boston and the Manhattan Trade Schools are furnished with great simplicity, merely reproducing good workroom requirements. The cost of supplies for trades taught, in both schools, is more than covered by the trade orders executed and by the sales of finished work. Shops which exactly reproduce trade conditions are an important part of the educational work of these institutions. The providing of correct materials, which must be often very costly, is a serious question in the short-time trade school. The girls are too poor to buy materials even to make the simplest gar-

ment for themselves,—the clothing which is worn daily being often the complete wardrobe of the wearer. The taking of order work has proved not only to eliminate expense, but to lend reality and interest to the instruction. The cost of articles is kept strictly up to the market. When a large amount of order work is turned out by a school every year, the business management connected with the invoices, sales and delivery of the goods requires special attention and expense.

In all three of the schools mentioned there are methods of giving aid, according to the need, to those who cannot otherwise attend. This has been found to be absolutely necessary. The money appropriated for such aid is outside of the yearly educational budget, but must also be reckoned with when a school attempts to help the poorest class of workers. Experience at the Manhattan Trade School seems to indicate that about one-fourth of the students need some assistance ranging from carfare only to the equivalent of a small wage which the girls could make in trade and which the parents cannot forego.

THE APPRENTICESHIP SYSTEM OF THE GENERAL
ELECTRIC COMPANY AT WEST LYNN,
MASSACHUSETTS

BY MAGNUS W. ALEXANDER.

The recent period of unprecedented industrial prosperity has revealed in a striking manner to the American people that the supply of skilled workmen in this country is utterly inadequate. Even during the business depression that set in over a year ago, the demand for skilled and intelligent mechanics and foremen has in most instances been greater than the supply. Unless we eliminate this great weakness in our industrial system, we may well look with apprehension to the time when the wheels of industrial activity will again turn at a lively speed. Thoughtful and far-sighted men should, therefore, give close and careful consideration to this matter in order to avoid a future check on the industrial development of the country.

In the main, there are three methods by which the youth of this country can be trained for a life of industrial efficiency,—the apprenticeship system, the private trade school, and the public school. Whichever method of industrial education is selected in any particular case to meet the needs and conditions of a community, it can be effective only if it is based on the broad principle of correlating the training of the hand with the development of the mind in the effort to obtain skill and intelligence. Skill cannot demonstrate its full potential value and reap its highest reward unless it is supplemented by an industrial intelligence which animates the otherwise routine activities of daily life, and makes men conscious of the why as well as the how of all work. The joy that one then derives from his work will enhance the value of his task and give it individual significance.

The apprenticeship system of the General Electric Company at West Lynn, Mass., is perhaps the best exemplification of the efficacy of this principle, and inasmuch as similar systems have since been established by other manufacturing organizations, and the same idea has been adopted by trade schools founded in recent years, a brief

description of the origin, the progress and the effect of the Lynn system seems to be justified.

The General Electric apprenticeship system was founded seven years ago, when the Lynn works employed about 5,000 workers; and it has been developed to its present state during a time when the number of employees in the machine shops, pattern shop and the foundries of the plant has more than doubled. Its organization was based on a study of the then known apprenticeship system, an analysis of its inherent weaknesses, and an application of the proper remedies.

Before this time apprentices were assigned to shop departments whose foremen, being business men as well as mechanics in the fulfilment of their duties, could take only a general interest in the boys, and had to rely mainly on assistants for the training of the apprentices. It is obvious that the apprentices were, therefore, not placed under the most advantageous instruction. Inasmuch as the shop foreman lacked the personal interest in the boy that the journeyman master of thirty years ago had shown, and was actuated primarily by a desire for economic production, he was loath to put a new apprentice on a machine for fear that he might injure it on account of insufficient personal attention. He was apt to keep the boy unduly long on an operation which he had learned, in order to get the greatest commercial advantage from him. The sameness of operations in one department helped to militate still further against the apprentice of that department, who found himself at a disadvantage when contrasted with one who had had an opportunity of a greater variety of instructive work in some other department of the factory. The desire of the apprentice to learn came in conflict with the purpose of the foreman to secure economy by cheapness of production, and while the fittest of the boys survived what proved to be a hard struggle for success, many fell by the wayside who, under more favorable conditions, might have developed into efficient and skilled mechanics.

The employment of a supervisor of apprentices by some manufacturers was a step in the right direction, and eliminated some of the existing defects in the training of boys. Representing the employer as well as the apprentices, the supervisor served both in looking after the general welfare of the boys, advancing them from one kind of work to another. To the extent to which he possessed

breadth of view and ability to secure the co-operation of the foremen, he fulfilled his dual task to the advantage of the boys and the employer. There still remained a deficiency in the system, in that those in direct charge of the training of the boys did not usually measure up to the best teaching ability. The significance of this weakness is most important in that a solid or faulty foundation of training, after all, determines the strength or weakness of the whole structure of future achievement.

In order to get the best results from the apprenticeship system the General Electric Company at West Lynn, Mass., organized a special department—training rooms—devoted entirely to the preliminary practical training of the apprentices. It appointed a superintendent of apprentices who was especially qualified for the difficult task of teaching, and placed him in direct charge of the training rooms. Furthermore, it made an arrangement whereby such instructive commercial work could be transferred from the factory into the training rooms from time to time as the development of the apprentices might require. An equal and fair opportunity to learn a trade was, therefore, offered to all apprentices. Finally, the General Electric Company established classrooms in the factory in which the boys might receive mental training in the related sciences, and instruction in mechanical drawing, to the end that theory and practice might be correlated as far as possible. It is the aim of the company to develop skilled mechanics in the trades of machinist, toolmaker, patternmaker, iron, steel and brass molder, as well as to create a body of efficient and well-dispositioned journeymen upon whom the company may draw from time to time for industrial foremen and their assistants in the different departments of the factory, for tool designers, factory engineers, and other leading men in the organization. The training which a boy receives at Lynn is so broad, however, that the graduate apprentice is prepared to fill a position as skilled journeyman or as industrial foreman in any mechanical establishment.

By the terms of the apprentice agreement, boys of from fifteen to eighteen years of age, who have had at least a grammar school education or its equivalent and are physically sound, are eligible to the courses, which for machinist, toolmaker and patternmaker apprentices last four years, and for molder apprentices three years. Apprentices with an advanced education, however, are given an

adequate allowance of time. All accepted applicants must serve a trial period of two months, and only those who during this period give proof of native ability for the chosen trade, and show a mental and moral make-up that gives hope of developing intelligent and well-dispositioned journeymen, are permitted to sign the regular agreement. The latter is considered as an agreement of honor rather than one of legal force. The main motive of the whole training of the apprentices is to stimulate their ambition and arouse their zeal to develop themselves in order that they may advance from one task to another as rapidly as possible on the basis of acquired skill and efficiency.

Most of the applicants for apprenticeship reside, of course, in Lynn and vicinity, although many come from other parts of Massachusetts, from other New England states, and in fact from more distant parts of the country. In order to allow ambitious boys, not residing within easy reach of the factory and having no financial support from home, to take advantage of the opportunity offered at Lynn, the wages have been arranged for all apprentices so as to make the boys self-supporting even during the trial period. On the other hand, the company selects its material with great care and expects a fair return in work for the wages paid. In round figures, apprentices receive \$5.00 per week for the first year, inclusive of the trial period; \$6.50 per week for the second year; \$7.75 per week for the third year, and \$9.00 per week for the last year. Molder apprentices receive the wages of the last three years.

At the satisfactory termination of the course a "Certificate of Apprenticeship" and a cash bonus of \$100 are awarded to the graduates, who are encouraged to remain with the company at such journeymen's compensation as they are able to earn. Usually from \$2.50 to \$3.00 per day is offered to the graduates, some of whom have been placed in positions of assistant foremen at adequate remuneration almost immediately after graduation from the apprenticeship courses. Some graduated apprentices, on the other hand, prefer to go to other factories, evidently desiring to broaden their experience and to see something of the world, as they express it. No attempt is made to dissuade them from carrying out their plans, but experience has shown that most of them return after a while to their alma mater, where they have made their friends. This feeling of loyalty is a gratifying assurance of the future personnel of the foremen and

assistant foremen of the company, who will probably be drawn to a large extent from among the graduated apprentices. An apprentice alumni association fosters also this feeling of loyalty and comradeship.

Reference has already been made to the training room feature of the General Electric apprentice system as a means of initiating boys into a trade under most expert instruction and the most favorable conditions. The company maintains training rooms for machinist and toolmaker apprentices, and a separate room for the training of future patternmakers. No such provision has as yet been made for boys learning the molder's trade, but there is no good reason why this should not be done in the near future.

Beginning in a small way, with a floor space of about 750 square feet and half a dozen old machine tools, the machinist training room has grown in size and equipment until to-day it covers an area of more than 10,000 square feet, with over 100 representative machine tools. Similarly, the training room for patternmakers occupies a floor space of about 2,000 square feet, with a complete patternmakers' tool equipment for thirty-five or forty apprentices. It will be sufficient to describe here more in detail the methods of instruction in the machinist training room as illustrating the peculiar features of the Lynn system.

The present tool equipment in the machinist training room consists of twenty drill presses of various sizes, forty-four speed and engine lathes, some belt driven and some provided with individual motor drive; a pulley lathe, two turret lathes, two twenty-four-inch planers, one belt driven and one motor driven; nine shapers, one vertical boring mill, four plain and two universal horizontal milling machines, one vertical milling machine, one slotting machine, one spliner, two universal grinders, one surface grinder and three wet grinders, four tool grinders, one motor driven hack-saw and one cutting-off saw, two arbor presses, two bench watchmakers' lathes, besides a number of small electric bench drills, buffing and polishing motors, and forty vises. There is also a small blacksmith equipment and a stock of necessary small tools, such as drills, taps, reamers, chucks and arbors.

Many of the machines are of the latest and most approved type. Some are, however, second-hand tools which had been discarded by the shop foremen and relegated to the scrap heap. The use of old

machines serves a two-fold purpose—the economic and the educational. It prevents the abuse and injury of high-priced modern tools by inexperienced boys, while at the same time it affords an opportunity for repairing machine tools, an excellent training for future mechanics in that it develops thoughtfulness, self-reliance and the ability to do things. In this way some of the old machines have been repaired again and again, being just as serviceable now as some of the high-priced modern tools.

Every boy who is admitted to the trial period starts his career in the training room, where he is under the direct supervision of the superintendent of apprentices, who is thus afforded an opportunity to study carefully the boy's mental capacity, his native ability for the chosen trade, and his general character. From the very outset the apprentice is required to do commercial work, even though this may be his first experience with machine tools. The training of the boy on commercial work is of great psychological importance, in that it takes him out of the sphere of laboratory work into that of industrial life. It clinches the boy's interest inasmuch as it makes him realize that the product of his work is to be a part of some useful machine rather than a plaything or an object of exhibition in some showcase. Commercial work teaches the boy the value of time and money and stimulates him by making him feel his place in real industrial life. Ample opportunity is given here to those who possess inventive ability, and each apprentice is taught individually and advanced in his work in accordance with his capacity. No schedule of time on the different machines is laid out, therefore; the apprentice is required to stay on one machine and one operation until he has proved his ability to perform this specific work with accuracy and a fair degree of speed. It may take some apprentices a year and a half and others almost double that time to pass through the training room. In due time the apprentices are transferred into the factory and assigned to various departments for the remainder of their apprenticeship. Thus they round out their knowledge and skill on a variety of work such as the factory offers.

Some may now begin to specialize on die- and tool-making, on large or small machine work, or on such other tasks for which they seem to be best fitted. These apprentices are under the discipline of the shop foreman and subject to the rules of the department, yet they still belong to the superintendent of apprentices and look to

him for transfer to the various classes of work and for general guidance. They are even subject to temporary return to the training room when, in the opinion of the superintendent, they require closer attention because of their failure to keep up with speed and accuracy standards or to conduct themselves properly.

Inasmuch as most of the apprentices, in taking their positions later on in the factory organization, will be called upon to instruct those under them, an early effort is made in the training room to develop in the apprentices the ability to impart knowledge to others, to handle men and work. A method has, therefore, been adopted under which the apprentices are given frequent opportunities to act as temporary instructors. Accordingly, each apprentice, at various times during his stay in the training room, must help to instruct a less-advanced apprentice in the operation which he himself has already mastered. The general instructor, of course, starts off the team of boy teacher and boy pupil, but after he has done this he leaves the instructing and supervising to the boy teacher, returning from time to time, to make sure that the team is proceeding in the right direction.

It is obvious that the young master will put forth his best effort to impress the boy pupil with his own knowledge, and inasmuch as he is anxious to advance himself to some more difficult work, which he cannot do until the general instructor relieves him from the teaching work, he will take pains to put the boy pupil on his own feet. The latter, on the other hand, is anxious to stand on his own feet, and in turn to become a boy teacher; he is therefore eager to learn. Sometimes an apprentice acts as boy teacher to one who has already served a longer time in the training room than his instructor *pro tem*. This simply bears out the claim that all instruction in the training room is adapted as far as possible to the individual capacity of the apprentice, so that the capable one is not held back on account of other apprentices of lesser ability.

Under the boy-teacher and boy-pupil system only three journey-men instructors are required in the training room for about 100 apprentices. The instructors are responsible for the teaching of the boys as well as for the production and the general business of the department. Even should the number of apprentices in the training room grow to 125, no addition to the instructing force would probably be made, but the present instructors would be assisted to a still

larger degree by apprentices who are temporarily placed in charge of classes of work and groups of boys. For instance, at present an apprentice is responsible for the production of clutch pulleys in the training room. It is his duty to see that the boys engaged on this particular class of work attend properly to their duties and that the required number of clutch pulleys is turned out, tested, and put in shipping boxes every week. It is obvious that one or two months of such work tends to develop executive ability in those in whom this important quality lies dormant. The results obtained by apprentices in the training room are surprising even to those who watch the progress of work closely. It bears evidence that the possibilities of apprentices under proper guidance and instruction are remarkable if their ambition and interest in the work are aroused. This good and intelligent work, however, could not be accomplished if the classroom instruction, which is correlated with the practical training, did not make the apprentices mentally alert and place them in a position to read working drawings without difficulty, to compute every-day arithmetical factory problems and, in general, to understand the reason for every stroke of work which they perform.

The significant feature of the classroom instruction at Lynn lies in the fact that it is given to the boys during regular working time, rather than in the evening when, after a long day's hard work, the apprentices are usually neither mentally nor physically able to draw the greatest benefit from the instruction.

Every indentured apprentice receives instruction in the classroom for two hours four times a week, no school being held during part of July and August, so that the teachers and pupils may take their vacation at that time. Realizing that inasmuch as many boys have left school but recently in order to earn money, and on account of lack of appreciation of the value of education, the General Electric Company decided to pay apprentices the same wages during school hours that they would receive while working at the bench or machine. In this way, even those boys in whom the commercial spirit predominates and who therefore might not be willing to make an immediate financial sacrifice for the sake of possible greater returns later on, become anxious to secure an education. The improved character of the work of the apprentices in the training room and factory is the company's compensation for this expenditure.

In addition, it helps to create journeymen with a training that will enable them to grow into positions of responsibility.

The school program embraces instruction in mathematics, physics, technology and mechanical drawing. The teachers, who have been selected from the staff of the company's engineers, draftsmen and foremen, aim to awaken and exercise the boys' reasoning faculties, and develop their ability to think for themselves, rather than provide them with specific knowledge.

In order to achieve this result and to give to all instruction a concrete value, thereby clinching the boys' interest in the work, the teachers confine themselves as far as possible to the explanation of principles through practical problems and to this end select problems from among the occurrences of daily factory life. This method has the added advantage of initiating the apprentices into the technicalities of the business by acquainting them with the apparatus manufactured and the different materials used in the shop, and familiarizing them with the very problems whose solution will be expected of them later on as journeymen, foremen, and engineers. To ascertain the weight of material required for the production of three electric motor shafts in accordance with a given drawing, and to estimate the labor cost on the basis of estimated time for machining, all of which merely requires the reasoning out of mathematical processes already learned in school, are of infinitely greater value to the apprentice than the computation of the cubical contents of a cylinder of given dimensions, which calls for the same mathematical processes but is dependent for its solution chiefly on the memory.

Similar value is gained from instruction in physics, if, for instance, the law of levers is deduced by the boys themselves from a series of experiments with varying weights and positions of the fulcrum carried on until they perceive the proper relation between weights and power arm and weight arm. Through practice to theory is the guiding principle in the educational work. Great emphasis of course is laid on the instruction in mechanical drawing, which aims to enable the apprentices to read drawings quickly and intelligently, and for that reason presupposes the ability to make drawings. This branch, however, is taught not so much for the purpose of developing mechanical draftsmen as to serve as a means of teaching the designing of tools and jigs and fixtures needed for manufacture

on a large scale. A good tool maker is more valuable if he has the ability to design tools, and a good tool designer ought also to be a good tool maker. The combination of both qualifications is a valuable asset to any mechanic.

Under the guise of technology, an attempt is made to develop in the apprentices the power of concise and clear oral and written expression, and inasmuch as materials and their characteristics, machines and machine elements and their functions are taken as the text of the instruction, the apprentices acquire a technical as well as a general knowledge. One of the most interesting and instructive phases of this part of the school work is the "practical talk" which the superintendent of apprentices gives once every week in the classrooms. If he sees a wrongly-sharpened tool somewhere in the factory, or notices the abuse of any machine, he is sure to bring this tool into the classroom or to relate the circumstances under which the machine has been misused, in order that the apprentices may avoid similar errors in their own work. "Practical talks" of this kind are bound to be of the greatest value to the apprentices, and therefore to the company when journeymen thus trained become part of the factory organization.

Groups of approximately fifteen boys form a class, some receiving instruction from 7 a. m. to 9 a. m., others from 10 a. m. to 12 m., or during the first or last part of the afternoon. Three classroom instructors, therefore, may easily take care of approximately two hundred apprentices. There are nearly two hundred and fifty working at Lynn, including those who are serving their trial period, and are, therefore, not yet entitled to the classroom instruction. Seventy-six apprentices have so far graduated from the course and *over fifty* are at present in the employ of the company, some of whom are filling positions as assistant foremen and inspectors, a few having developed into very good tool designers. The apprenticeship system of the General Electric Company at Lynn proves that a broadly-conceived plan efficiently executed will work out to the advantage of all concerned.

THE JOHN WANAMAKER COMMERCIAL INSTITUTE— A STORE SCHOOL

BY JOHN WANAMAKER,
Philadelphia.

The application to the Court of Common Pleas of Philadelphia during the month of September just past for a charter for the "*American University of Applied Commerce and Trade*"—the first of its sort—has brought, perhaps rather importantly, before the public eye an educational system that, for as many as twelve years, has been in active operation in a very quiet way under the title of "The John Wanamaker Commercial Institute." A "Store-School" it is commonly called by those who know it, for it is an organization inside the Wanamaker store in Philadelphia to enable those who are doing the day's work and earning a living to get a better education to earn a better living.

It is the first actual "school of practice" of business methods, giving daily opportunities to obtain a working education in the arts and sciences of commerce and trade. When a young man graduates from it he receives a degree which is in effect a combination of what Harvard College calls the degree of "Master of Business Administration," with a certificate of a certain number of years' actual experience in the business world. His career and the development of his earning capacity have not had to wait until his college course ended—the two have marched along shoulder to shoulder, study assisting labor, and labor in turn illuminating and illustrating book knowledge. The two together daily increase his value to his employer and to himself.

The idea of the commercial institute (now developing into the American University of Applied Commerce and Trade) came long ago to the writer with a realization of the full and sacred obligations of employer and employee. The payment of an agreed wage from one to the other, the taking in exchange specified hours of labor and the continuation of this mechanical system through weeks and months and years, define neither an employer's relation to his people nor the duty of the workers to one who happens to control their output of energy and brains.

Every man who studies along the fine and broad lines of commercial enterprise to-day must recognize the fact that a business career is a profession as noble in its way as that of the lawyer or the engineer. Men and women must be trained for it. They must become specialists. The little boy who comes into a store forced by the driving necessity to begin the task of earning a livelihood must not, for the honor of the profession, be allowed to drift along undisciplined and unlessoned in the science of his work. He must not for his own sake be permitted to stand dead to development, content to live on the small stock of educational provisions that he laid in before his working days commenced.

From some such threads of thought as these sprang the idea of "The John Wanamaker Commercial Institute." It has never been a part of the business made public, and yet it has been the pivot about which the organization of the store staff swings, for it largely determines the positions of the younger people, their wages and their advancement. High standing in the school's records means certain promotion in the section of the store work to which a student is assigned; habitual low marks, indicating a lack of interest or a lack of capacity without improvement, result in a change of names on the payroll. To-day about 7,500 graduates of this commercial institute are showing the mercantile world what new kind of business men and women may be produced by this store-school.

Of necessity the time given to recitations in the school-room is limited. It is "little and often and continuous" that counts, as the horse said every time he put down a foot. The smaller boys and girls of the store have their separate school sessions in the morning and reach their posts of duty in the business proper by ten o'clock. Each pupil has two such sessions a week besides the hours for drill and special training. Three hundred older boys have two regular evenings of school each week, after a hot supper in the store dining rooms at the close of the business day. The faculty of the institute consists of twenty-four teachers, some of whom are instructors in the daily schools of Philadelphia, and in the curriculum you will find classes in reading, writing, arithmetic, English, spelling, stenography, commercial geography, commercial law and business methods.

A very important development of the school life among the boys is a military battalion of six companies, officered by the boys

themselves. This military phase of the school is the garden where grow the lessons of discipline, organization, precision and obedience, and the health lessons of muscular training that give bodily strength without which successful mental work is impossible. A military band of seventy-five pieces and a drum and bugle corps of forty are outgrowths of the organization, and happy summer vacation times are spent by the little soldiers tenting in squads on a campground of five acres at Island Heights, New Jersey, with headquarters at "The Barracks," by the sea.

The girls of the store also have their military drills and their own drum and bugle corps, while their military band is developing. All are trained in singing, and there are many incidental interests, such as the orchestra, to which thirty students belong, the mandolin club, glee club, savings fund, etc. For those who wish to become proficient in foreign languages there are classes in French and German. Attendance at these classes is required of such of our people as need to go abroad in the course of their business dealings, but is voluntary with others who are aiming to fit themselves for these positions.

Progress in the institute goes on by regular system. The little boys of the morning school pass by promotion into the older corps and the evening school. The girls' classes, always separate, are graded from lowest to highest. Boys and girls graduate in due process, receiving a diploma that is highly prized as an evidence of experience, attainment and good standing in the esteem and respect of the store management. They are then full-fledged members of the staff of the particular section of the store in which they are employed—no longer "boys and girls," but "men and women" of the store, trained and fitted into some well-defined division of the activities of this great commercial house. Their future is circumscribed only by their personal limitations, for it is a great fixed policy of the house to build up from the ranks, and the boys and girls of to-day will be the chiefs of to-morrow.

Twelve years have not been long enough to perfect this system of business education, which has made notable improvements in the methods of work, in the character, outlook and ethics of the personnel of the store. Unintelligent and wasteful labor has lessened. The wisdom of co-operation and mutual helpfulness has been recognized. Knowledge of merchandise, its production, distribution and

uses has been increased. Principles of control and government and organization have developed.

I may be permitted to say here that my confidence and firm belief in the value of the commercial institute and its relation and application to the laws of the business has led me to build it into the new Philadelphia store building in stone and iron and cement. Yes—there will be special classrooms, a library and reading room, a gymnasium and swimming pool for the use of the students. But that, as Kipling says, is another story,

TRADE TEACHING IN THE BOOT AND SHOE INDUSTRY

BY ARTHUR D. DEAN,

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The need of special training for the professional man is universally acknowledged, and we recognize its value to the artisan and the skilled craftsman in woodworking, plumbing, blacksmithing, etc. It is a well-established truth also that special education is desirable and necessary for those who are concerned with making the whole of a product or with such part of it as involves a sequence of operations.

Naturally, we form our opinion of what technical and industrial schools can do from what they have done for the machine and building trades. It has not yet been demonstrated that they are indispensable to all industries, especially those which, like the shoe industry, have been divided and subdivided so that the operator comes in contact with only a fractional part of the product. It is a difficult problem to discover the kind of training which shall be of direct value to the vast majority of workers who are doing piece work on automatic machines, or who perform a single operation of the one hundred and one of the factory, those who apparently require in their work the knowledge of that single operation only, a training in which it may take but a day to master and at the most, but a few months. The question then is: Has the performer of one operation on the machine day in and day out no need of special training for the daily work apart from the actual shop experience?

It is such an industrial and social question as this which makes the study of what is being done and can be done educationally for shoe workers of peculiar interest, for the shoe industry is a worthy example of the extent to which differentiation of operations can be carried. This differentiation is the inevitable result in other important industries and the solution of the educational problem in this industry ought to serve, in some measure at least, as a guide for all those which have similar minute divisions of labor.

Outside of a class in pattern drafting in a Montreal institution,

a course in leather at Pratt Institute, and evening classes in pattern drafting and upper leather cutting in three Young Men's Christian Associations, little has been attempted in America in education for shoe workers. Two Massachusetts high schools are endeavoring to give their pupils an idea of the shoe industry. Through the accounting end of the commercial course, the Lynn High School has made considerable progress. The local business firms contributed samples of everything which goes into the making of a shoe. One firm gave samples of shoes in various stages of construction. The value of this exhibit is \$250, and it has served as a start towards a commercial museum. The head of the commercial instruction has made a careful investigation of the accounting part of the shoe business, and has put in a full set of shoe manufacturing sheets in the bookkeeping classes. Actual business transactions are made throughout the work, and care is taken to conform with the methods of the best shoe factories in the city. Pupils make out a weekly payroll, figure out the cost of production, etc. Throughout the course extensive use is made of the shoe exhibit, so that pupils associate properly the technical names and the materials themselves.

In the Brockton High School there is a similar exhibit of shoe parts and materials. At a personal expense of \$400 a shoe manufacturer exhibited a line of shoes, arranged and labeled to show the process of manufacture in sequence. For the next school year an elective course is planned, dealing largely with the historical side of the boot and shoe industry. It will involve the evolution of the shoe, the development of the shoe industry in the world and in the United States, the history of leather making, the processes of tanning, the problems of making, transporting and selling shoes and other similar topics.

In this connection it may be well to suggest that chemistry, mechanics and mechanical drawing are closely related to the shoe industry. In chemistry, for example, a study of the chemical bleaches, such as sugar of lead, oxalic acid and ammonia and of the weight-giving adulterations such as barium chloride and glucose; study of where chemical action ends and physical absorption begins in the process of vegetable tannage; likewise a study of chrome tannage, patent and enameled leathers, stains and blackings would be of value.

In mechanics would it not be possible to have a consolidated

lasting machine, a pulling-over machine and other complicated machines which are built with mechanical movements like cams, levers, screws, inclined planes, etc., in the physical laboratory when the boys are studying mechanics, and to let them analyze the actions? In mechanical drawing the boys might make drawings of machine parts which are related to the shoe machines, make drawings which will assist in pattern designing, determine the superficial area of a plane surface with reduction and enlargement of patterns, etc., realizing, of course, that the pattern drafting is to the shoe worker what mechanical drawing is to the mechanic.

At present the major part of the training for shoemaking is being carried on in the shoe factories themselves. A prominent shoe manufacturer has stated that each factory is a trade school, but as a trade school, each is limited in the number of its students by the personal interest of the superintendent in his employees. Undoubtedly it is true that the shoe factories are making their own help, and so long as shoe factories are the only places in America that are training shoe workers it will be impossible to give any description of the present status of shoe education in America other than that already mentioned.

The country factory possibly comes nearer to being a trade school than the larger city plant. It is near the source of raw material and finds little difficulty in obtaining help. The so-called "cheap labor" (and it is cheap so far as wages go) is taken from the farms and woods with absolutely no conception of shoe work, and after six months' training is fairly competent in some one part of the work. By this time the worker has discovered that the country factory pays only about one-half what the big city factories are paying, and there is a second migration to the place of higher pay. In this way the country factories, as well as the plants where the cheapest shoes are made, are training grounds for the large factories. The system may not be commendable, but results are surprisingly effective.

Factories in towns at a distance from larger industrial centers complain of the loss of their good material as soon as the workers get a general knowledge of the work. "Stealing a trade" is the common term in the shoe industry. If a young man wishes to enter the shoe business he begins work in an open shop, usually in some small place away from the great shoe centers. It is not unheard of

for a man to obtain half a dozen different jobs in a fortnight, picking up a little knowledge of the work in each before being discharged for incompetency. When he has gained some skill he moves to the larger factory, where he pretends to be a skilled workman, and very often during the busy season is able to hold his job because of the scarcity of help. By the time the rush season is over he has really learned the trade and runs no more risk of being discharged than any other workman. Associations of this sort, now generally universal in the shoe industry lead the worker to learn the operation of some particular machine. Many skilled machine workers have picked up their trade in this fashion.

In turn, the city factories steal workmen from each other, for the large city plants cannot make their own help as well as the smaller plants in the country or the plants where cheap shoes are made. So agents are sent out, and men and women workers are taken from their employment in the factory where they have learned the trade and are pressed into service in some other. This is not as difficult as it may seem, for the many divisions and subdivisions of shoemaking render it possible to separate the unskilled labor most scientifically from the skilled. Men without a technical knowledge of shoemaking are employed in the capacity of shoe operatives engaged in a single specific operation.

Advance in a factory is not prohibited by modern shop organization. In almost any shoe factory in a New England state the manager can point out men in the best places who have started in the lowest positions and reached their present one by their own efforts alone. The boy may start in the cutting room on trimmings, heel stays or tongue, but if he shows that he can use judgment in placing patterns and cutting stock up cleanly and economically, it will be but a few seasons before he will be put to cutting tops or outsides. These points are made to show that advance is due to individual effort and ambition rather than to definite organized instruction such as would be given in a school. A trade is, then, not taught but picked up through keen observation and natural ability. But the average young man is held to one branch by economic pressure. It cannot be expected that, if he receives good wages under the piece-work system, he would leave one machine to learn to operate another where he would receive less money, being less skilled at the new work.

A brief description of education for shoe workers in other countries is in order. Such education has been developed in England more than in any other country, and can best be brought together under three groups: First, special shoe schools for shoe workers; second, special courses in existing technical schools for instruction in shoemaking and leather manufacturing; third, evening continuation schools.

The leather trade school at Bethnal Green, London, is of the first type. Free instruction is given in complete shoemaking, and one can become a very good shoemaker if sufficient time is given. The management of this school is vested in a general committee of representatives of the city and guilds of London Institute, the livery companies, and the Boot and Shoe Manufacturers' Association in proportion to the amount of their annual contributions. The school has the close supervision of an advisory committee, which investigates the technical work done as well as the methods of teaching.

It is suggestive that nearly fifty per cent of the teachers are graduates of the school. The school authorities believe that the training of teachers in their own school has assisted very materially in making the school a success, as the teachers follow the lines already laid down more quickly than expert craftsmen. While the school has a few day students, the majority attend at night. Special arrangements are made for teaching day students, through engaging practical men from various factories to give special instruction for a few hours one day a week. The machinery has been loaned by manufacturing concerns and donations of materials, such as leather and lasts are constantly being made to the school. One dollar entitles a student to attend any evening class for the whole session of three terms of thirty-nine weeks. The school is attempting to place before the students the general outline of the whole industry and at the same time to give a deep and wide instruction in one branch so that graduates may make immediate use of their skill.

Probably the best illustration of a school of the second class is that of the Leicester Technical School. This is one of the largest schools in the United Kingdom. Instruction is given in shoe manufacturing, hosiery manufacturing, plumbing, carpentry, architecture, etc. The shoe manufacturing classes are arranged in preliminary and advanced classes in pattern cutting, and lectures are given on

upper cutting, stitching room methods, bottom stockroom, lasting and finishing. After students have received important notes of the lectures in each department, a practical demonstration is given of fitting, stitching and lasting on donated machines. The British United Shoe Machinery Company contributes the machinery and sends its experts to give the practical demonstrations. Once a week a lecture by prominent shoe manufacturers is given on general subjects, such as "The Bone and Muscular Construction of the Foot," "Last Making," "Shoe Machinery Design," "Leather Manufacture," "Estimating the Cost of the Upper and Bottom Stock of a Shoe," etc. These classes are to enable workers not only to make a part of the shoe, but to learn the processes of the other departments and the technical names of each part of the shoe, thus producing better foremen and managers or superintendents.

The evening continuation movement of the Northamptonshire County Council illustrates the third type. This institution conducts classes in eight shoe centers. Various centers are grouped around one larger one with a full-time paid instructor at its head. At present schools have been organized at Northampton, Kittering, Wellingborough, Rushden, Irtlingborough, Raunds, Long Buckby. Instruction is given in the evening, and eighteen classes a week are handled at distances extending over thirty miles. These have a total enrolment of about three hundred students and a teaching force of three instructors. The fee is about sixty-two cents for the season from September to May.

The teaching is adapted to each place according to the grade of shoe made there. It is not expected that the shoe workers will be acquainted with the whole trade. However, there are some things in the shoe trade that an intelligent worker with a desire to advance must know. These are taught in a general section. At the same time the men desire to qualify as practical men in one branch. The school authorities allow them to select any one subdivision, but do not teach them any special operation by itself. For example, if a young man wishes to qualify as a laster, he is not permitted to be taught only how to tack a shoe upon a last; the school expects him to show that he understands thoroughly the principles upon which it is done and its effect upon subsequent operations. The course is divided into three years, although few students get through the three divisions in three years.

A comprehensive series of examinations has been inaugurated for stimulating the students. They are divided into a technical side and a practical side. If a student wishes to qualify, for example, as a pattern maker, he first attempts a written examination and then takes a practical examination in an ordinary workshop upon ordinary work. There is a great deal of elasticity in the teaching, according to the class and work of the students. The amount of time given varies in different towns. The average is about two evenings a week, depending largely upon what the local committee considers the best for that place. There is one point, however, which is always made, that every student must have some theoretical instruction, otherwise the school would produce the same class of workmen as are now in the business, instead of raising the standard of the men employed. To give the boy an efficient training and to give the man, who has probably lost educational opportunities, some chance of supplying what he has lost, is the educational ideal. Out of a hundred students taken at random twenty-nine have become manufacturers or retailers or managers since they attended the classes, and thirty-seven have become pattern makers. There are very few of the men who have not received benefits from the continuation school work.

Another important school is the Royal Prussian Shoe Technical School at Wermelskirken, Germany. It was founded by the City of Wermelskirken. It is in the Province of Dusseldorf and is supervised and supported by the German Government. The school is conducted by a director, who understands the needs of the shoe industry, and four experienced teachers, all of whom are experts in their several lines. The main purpose of the school is to educate superintendents, foremen of the bottoming and stitching rooms and pattern makers. The course is so laid out that the graduates can take any position in any branch of the shoe industry. The school runs for eight hours a day for forty-six weeks in a year. The time required to fit a man for the superintendency is two years, while one year is all that is necessary for the foremanship of a bottoming or stitching room. It takes six months to properly train a pattern maker. The cost per course for half the school year is approximately thirty dollars. In other words, the training for a superintendent, who ought to take the courses in the stitching room and bottoming room, and in pattern making, would cost \$360. The

upper course, as it is called, consists in trying different styles of shoe patterns, cutting patterns and setting various combinations of different patterns. The cutting course consists in laying out of the patterns of different sizes on various kinds of leather in order that the most economical system of cutting may be determined. Accompanying the work in the cutting of shoes are lectures about the different processes of tanning, upper shoe stitching, calculating stitching cost and the cost of shoe findings, with the accompanying calculations of wages. The bottom course consists of drawing different soles, insoles, and heels, cutting soles, designing cutters and working out the curvature for the heel knives. It also includes a study of the dyeing and tanning of sole leather, and calculating the cost of sole leather as estimated by the waste and the wages paid. The finishing course includes the finishing by the various special machines, the ironing of uppers, their blacking and finishing, as well as the study of various formulæ for preparing inks, dressings and stains.

In the United States there is need of special schools for those who are to enter the shoe industry. An industry which employs nearly 150,000 people, which has a working capital of \$125,000,000 and makes a yearly product valued at \$320,000,000, is surely as worthy of having special schools for the training of skilled help as are the textile and machine trade industries.

THE APPRENTICE SYSTEM ON THE NEW YORK CENTRAL LINES

By C. W. CROSS,
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The apprentice system recently introduced upon the New York Central lines, and now being extended as rapidly as possible throughout the system, is a development which could with great advantage be paralleled in manufacturing and commercial organizations. While it is too soon to judge accurately of the final results, those thus far apparent, and the very rational and practical methods which are being used, indicate that such efforts will very materially improve labor conditions and add greatly to the efficiency of the organizations making them.

Those who are familiar with the present labor situation, the lack of skilled mechanics, the difficulty in securing foremen and the gross neglect on most roads of a system for recruiting good men for these positions, must realize the need of improvement. The most forceful presentation of this subject which has ever been made, whether we consider the railroads alone or the manufacturing of commercial interests at large, was by Mr. G. M. Basford in a paper read before the Master Mechanics' Association in 1905.¹ The necessity of installing such a system, and a general outline of a system, which would produce successful results, under present conditions, was clearly presented. These suggestions have been followed quite closely in working out the details on the New York Central lines.

The system adopted may be summed up under the following heads:

1. Close supervision and instruction of the apprentices in the shop by an apprentice instructor is provided.
2. A school is conducted by the company during working hours, at which mechanical drawing is taught in a practical way. The apprentice is paid for attendance.

¹"American Engineer," page 251, July, 1905.

3. A course of problems, carefully arranged to suit the needs of the apprentices, has been prepared. These they are expected to work out on their own time.

While the system differs radically in many respects from anything that has heretofore been done in this country, it follows more or less closely the general principles governing the educational system of the British Admiralty, which has been in operation more than sixty years and, according to Sir William H. White, has produced the majority of the men who are now occupying the most prominent positions in the ship-building industries of Great Britain. He says of the system: "It has given to private ship-builders its leaders, who have risen from the ranks, while it has produced men holding many important and influential positions in all parts of the world."²

The only system that has been carried out on a large scale in this country, which at all approaches the methods used on the New York Central Lines, is that of the General Electric Company's apprentice school at Lynn, Mass.³ A special shop has been fitted up at Lynn known as the "Apprentice Training School," and for the first one and a half or two and a half years the boys work in this shop under the direction of competent instructors. The production of this department is of commercial value. The latter part of the course is spent on regular work in the shops. A school is conducted during working hours at the expense of the company, each apprentice receiving six hours' instruction a week.

Manufacturing industries are suffering greatly from the lack of suitable means for recruiting skilled labor, and unless immediate steps are taken to remedy the difficulty the commercial resources of the country will be seriously crippled. The same thing applies with equal force to the motive-power departments of our railroads.

It is true that here or there a railroad or a shop has given some attention to this subject, but generally speaking, it has been almost lost sight of. The old methods are not suitable for the new conditions, and an adequate system cannot be installed and carried on successfully as a side issue by an officer who has already all he can do. Fortunately the formation of large railroad systems, each made up of several railroads, makes it possible to place a work of this

²See article in "Techniques," January, 1904.

³Described in a paper on "A Plan to Provide for a Supply of Skilled Workmen," presented by Mr. Magnus W. Alexander at the December, 1906, meeting of the American Society of Mechanical Engineers.

kind in the hands of a qualified man who can give his entire time to it and employ the necessary assistants.

It was with a clear understanding of this fact that the officials of the New York Central lines set about the formation of a school to train apprentices. The purpose of such movement, if it is to be successful, must be in line with the suggestions of Mr. G. M. Bashford, used in closing the discussion of his paper for the Master Mechanics' Association two years ago. "I beg you to bear in mind the pyramid—a pyramid of the rank and file, the rank and file of the workmen, upon whose shoulders you stand. As the base is great and upright and strong morally and intellectually, so is the structure. No structure is great and permanent that is not right at the bottom." If steps are taken to furnish a good supply of skilled workmen, well equipped for service under modern shop conditions, there will be no trouble in developing men from among them for the highest positions.

Although at the inauguration of the new plan there were twelve shops on the system, each of which had from twenty to seventy-four apprentices, apprentice schools of some kind had been carried on previously by the local managements at only four points—Elkhart, Ind.; Jackson, Mich.; Oswego, N. Y.; McKees Rocks, Pa.

Development of the Apprentice Schools

About thirty-five years ago an apprentice school was started at the Elkhart shops on the Lake Shore and Michigan Southern Railway. The sessions were held in the evening and the school was intended primarily for apprentices, although anyone in the employ of the company was eligible for membership. Instruction was continued with more or less success, and in 1901, under the direction of the writer, then the master mechanic, attendance was made compulsory for apprentices, and what was known as the apprentice association was organized. This association held meetings every two weeks, at which reports were made by committees who had visited other shops, or addresses were made by persons skilled in different classes of work. While membership in the association was not compulsory, the greater number of the apprentices belonged to it, and the meetings were well attended.

On July 28, 1886, evening class work for the apprentices was started at the Jackson shops of the Michigan Central Railroad.

For the first few months the classes were held from 7 to 9 p. m., but this did not prove satisfactory and the hours were changed to 5.15 to 7.15 p. m. Each class met one night a week from November 1st to April 30th. Attendance was made compulsory. In January, 1904, an apprentice school was organized at the Oswego shops of the New York Central under the direction of Mr. W. O. Thompson, division superintendent of motive power. This class met for two hours, one day of each week, directly after the whistle blew at the close of the day. Attendance was made compulsory for the apprentices, and they were paid for their time in the class, thus making it possible to enforce a somewhat more rigid discipline. About two years ago an evening school was organized at the McKees Rocks shops of the Pittsburgh and Lake Erie Railroad. The classes met twice a week and attendance of the apprentices was made compulsory. Mechanical drawing was taught at these four schools, the method being the same as that ordinarily followed, including practice in lettering, geometrical exercises, projections, copying of drawings and blue prints, making drawings of locomotive parts and making tracings.

The apprentice department of the New York Central lines was inaugurated on March 1, 1906. On May 7, 1906, the first apprentice class, under this new plan, was started at the West Albany shop. It was realized, of course, that while there would be some advantages which would be almost immediately apparent, the most important results would not be noticeable for a number of years, and, therefore, before starting the organization steps were taken to insure its permanency for a period of sufficient length to enable the results to be clearly demonstrated.

Organization of the School

The department as at present organized is under the direction of the writer, superintendent of apprentices, who devotes his entire time to this work. Mr. H. Gardner, assistant superintendent of apprentices, has charge of the educational features. Mr. Gardner is a graduate of the Massachusetts Institute of Technology and was engaged for a number of years as an instructor. He has thus had exceptional opportunities for studying boys and young men of about the same type as the apprentices in railroad shops, and understands thoroughly how to arrange the work to hold their interest, and so

they will understand how to apply what they have learned to practical purposes. This central organization, with offices at the Grand Central Station, New York City, deals with the general problems affecting the apprentice work, outlines the different courses, looks after the educational work, organizes new schools and keeps in close touch with all the needs of the institution.

The boys come into contact with actual shop conditions from the very first. At each of the larger shops are two instructors, a drawing instructor, who in most cases is the shop draftsman, and who has charge of the school work, and a shop instructor who gives his entire time to instructing the apprentices in their shop work and to seeing that they receive the proper shop experience. Both of these men report directly to the local officers of the road, who keep in close touch with the apprentice department. The apprentices are, therefore, instructed by men already in the service of the company, on the shop property during working hours and while under pay. The instruction is given in the shop on the regular tools and in the regular run of work. The schedules followed insure a thorough training in the trade and give the necessary variety of work.

The drawing and the problem courses are arranged to allow each apprentice to progress as rapidly as he desires, but so as to enable a single instructor to handle classes with as many as twenty-four students in a class. The work assigned is such as to fit the standards of the road. The students are taught to read in the language of the shop and to meet the special conditions locally existing.

Method of Instruction

The method of instruction differs radically from the ordinary methods of teaching in the following points:

(1) Text-books are not an essential part of the plan. (2) There is no sub-division into subjects. (3) All principles are clothed in problem form. (4) There is no arbitrary standard of the amount of ground to be covered. (5) No examinations are held. The progress and the marks of the apprentices are based on the close personal touch maintained between the instructors and the apprentices.

The apprentice work can be installed at the greater number of the shops by using talent already in the service of the company. The men in the shops, both foremen and workmen, have evinced

considerable interest in the apprentice school, and there has been a demand for evening schools to give them the same advantages. In response to this desire, evening schools have been started at a number of places, including McKees Rocks (October, 1906), Elkhart (November, 1906), Jackson (November, 1906), West Albany (November, 1906), Brightwood (December, 1906), Oswego (January, 1907), and Collinwood (February, 1907). These classes are open to all of the employees at all of the points except Elkhart and McKees Rocks. They meet for an hour and a half or two hours directly after the shop whistle blows in the evening. At Elkhart the classes meet from 7 to 9 and at McKees Rocks from 7.30 to 9.30 p. m. The men are more regular in attendance and take a keener interest in the work when the meeting is held directly after the shop closes. In many cases the men live a considerable distance from the shop, and it would not be convenient for them to return after going home to their dinners.

The make-up of these classes is very interesting and will give some idea of the extent to which this work has been carried. At several of the schools where there is a full quota of apprentices and a waiting list, the boys take places as helpers until there is an opening for them in the apprentice department. These boys usually enroll in the evening classes. Boys who have finished their apprenticeship also follow up their studies in connection with the evening classes.

The men who attend the evening classes take the same course as the apprentices, but if they desire may skip the easier portions. As a rule they prefer to take all of the work, reviewing that part with which they are familiar. They furnish all of their own material and pay the instructor, the apprentice school drawing instructor, for his time. The cost of tuition amounts to about \$1.25 per month, which ordinarily includes nine lessons. The classes are held in the apprentice school room, the company furnishing this with light and heat, free. Only the drawing work is done in class, the problems being worked outside.

These evening classes give the more ambitious men an opportunity for becoming more proficient and to fit themselves for better positions. They are especially valuable for foremen and for assistant foremen who desire to "brush up" their knowledge of drawing and mathematics. As a result the shop men are becoming more familiar with the company standards and are being drawn into closer touch with the shop draftsmen.

Location of Schools

The schoolroom should be located near the shop buildings from which the greater number of apprentices come, in order that as little time as possible will be lost in going to and from work, and so that the boys can conveniently drop in during the noon hour. The room should be well lighted and ventilated. Provision should be made if possible for sufficient blackboard space to send the entire class to the board at one time. Floor area, including the space occupied by the filing cases, racks or tables for models and the instructor's desk, should average at least twenty-five to thirty square feet to each member of the class.

At West Albany the schoolroom is on the ground floor of a building next to the machine shop and opposite the office building. A connecting room at one end contains the filing cases and large models. At Oswego, Depew, Jackson and Collinwood the schoolrooms are in the office building, the one at Depew being especially large and well lighted. At McKees Rocks a large room on the second floor of the storehouse, which is centrally located, is used. At Elkhart the school is held in a separate building which was formerly used by one of the other departments. It is well lighted, as it is comparatively narrow and has windows on both sides.

The building at Brightwood, on the Big Four, was built especially for the school. It is of frame construction, located conveniently, and the large amount of window space furnishes splendid light. The inside dimensions of the building are 25 by 50 by 13 feet high. The classes at this place meet twice a week for the first two hours in the morning. The boys are bright, fresh and clean at this time of day and able to do their best work. This is much more satisfactory than evening classes, as the boys are in a more receptive frame of mind than after a long day in the shops. The school is closed during the month of August. The boys ring in at the shop before coming to class, and at the close of the session proceed directly to the shop.

The total number of apprentices enrolled in the schools at the present time is about 500. The total number of apprentices on the New York Central lines, not including the Boston and Albany, is 667. Extension to the other large shops of the company is taking place as rapidly as possible.

No attempt has been made to grade the classes according to the

progress made by the students except at Oswego. At that place conditions at present are such that this can be done. Care is exercised that too many boys are not taken from any one department in the shop at the same time, so as not to interfere too seriously with the shop work. The drawing course is arranged so that one instructor can look after as many as twenty-four boys at a time, although smaller classes may be handled to better advantage. The average number of students in a class is about seventeen.

Character of Instruction

The class work is largely mechanical drawing, although some time is devoted to blackboard exercises in connection with the problem course, and occasionally the instructor may find it advisable to talk to the class about the work in the drawing or problem courses. The students are also instructed from models as to shop practice and taught the principles of the steam engine and valve setting with the aid of a small stationary engine in the classroom.

The drawing course is very different from that ordinarily followed, and is based on strictly practical and common-sense lines. No time is wasted on geometrical exercises, but from the very first the student draws objects with which he is familiar and comes in contact in the shop. The first exercises are largely redrawing correctly sketches which are not in scale, the dimensions in all cases being taken from the model. New principles are introduced gradually, and progress is slow but very thorough. Like the drawing course, the problem course is eminently practical and based on shop practice and company standards. No matter how simple the problem, even in simple addition and subtraction, they refer to something with which the boy is familiar in connection with his work. The problems gradually grow more difficult, taking up the simpler principles of algebra, geometry, physics, elementary mechanics, etc., but these are introduced only when necessary to solve some practical problem and are not classified as such. The boys do the greater part of the problem work at home. It is not possible to use textbooks in connection with either of the above courses. The work must be arranged to suit the special conditions met with in a railroad shop, and to be effective the problems must be tied up closely to the shop work. For instance, the drawing and problem courses for the locomotive and car department are not alike. The drawing

problems are arranged on blue print sheets and when a boy is ready a problem sheet and a model are handed to him, the sheet giving the directions as to what is to be done. In this way each boy in the class can work on a different problem, and yet the work of the instructor is very little more difficult than if all were on the same problem.

The Drawing Instructor

The success of any such system of instruction depends very largely upon selecting the proper men for instructors. The drawing instructor should preferably be the shop draftsman, thus being brought in close contact with shop problems and also with the men in the shop. He must be a man who will take a genuine interest in the boys, and who can see things from their point of view; a man that the boys will not fear to approach, either for information as to their class of problem work or for advice as to personal matters.

The instructor should be a man to whom the boys will look for advice and assistance in forming apprentice clubs or organizations, whether intended for educational or social purposes. One instructor who is especially close to the boys is very often accosted on the street in the evening by boys who have questions to ask in connection with some problem. Some make a practice of calling on the boys at their homes when they have been absent from the shop due to illness or other causes. A quiet talk with a careless or indifferent boy often accomplishes remarkable results.

The Shop Instructor

The shop instructor is an important factor in the organization. At the larger shops he gives his entire time to looking after the apprentices. He instructs the boys at their trade and sees that they are changed from one class of work to another, in accordance with the apprentice schedules. In changing the apprentices about the instructors consult with the various foremen, studying the situation carefully, in order to have as little friction as possible in making the changes, and so as not to interfere too greatly with the efficiency of any one department. His suggestions must, of course, be approved by the shop superintendent before they go into effect.

With the school in operation the apprentices report to their foremen in the shops, as before, but the foremen are relieved of all

responsibility of instructing them. Ordinarily very great returns are not to be expected from the introduction of an apprentice system until after a period of several years, but the work of the shop instructor has been found to affect almost immediately the shop output, and this is to be expected. The shop foremen are too busy to spend much time with the boys, and ordinarily the instruction in shop practice has been very much neglected, thus restricting the output and increasing the amount of spoiled work.

The shop instructor, like the drawing instructor, must have a great deal of patience with the boys and take a genuine interest in them. He must be a good mechanic, must have sufficient all-around knowledge to enable him to look after the boys in the various trades, and his position in the shop organization should be such that the boys will look up to him. Most of all, he should be a man who will appeal to the boys and know how to convey his ideas so that they will readily understand him. He should take a broad view of the shop problems, giving the boys some idea as to the general principles affecting their work, such, for instance, as movement of material through the shop, the cost of production and the elimination of lost motion in performing their work.

In addition to what financial compensation the drawing and shop instructors receive there are other important advantages to them. To handle their work successfully they must study up and become more familiar with the work in the various departments of the shops. They become familiar with shop practice at other points on the system by occasional visits. If they have marked executive ability it soon becomes apparent and this, with the broader view they have of the shop operation, fits them for more important positions in the organization. Nothing is quite so important in crystallizing one's ideas and broadening one's outlook as trying to instruct others.

Equipment

An effort has been made to provide sufficient blackboard space in each schoolroom, so that the entire class, if possible, may be sent to the board at one time. A standard drawing table is used at several shops, but at others the shape of the room, or equipment already at hand, made it advisable to deviate from this. The form favored is simple, but substantial and inexpensive. Drawing stools are furnished and are especially appreciated by the evening classes.

Cases are provided for filing the drawing boards and tools. Each drawing board is numbered and is filed in a corresponding space in the case, the tools being placed in an orderly arrangement on top of the board.

Each boy is furnished with a pine drawing board, shellac finish, 18 by 24 by $\frac{11}{16}$ inch thick. The boards have hardwood strips $\frac{1}{4}$ by 1 inch mortised in each end to keep them from warping. In addition, the boy is furnished with a T-square, celluloid triangle, a wooden curve, triangular box scale, thumb tacks, erasers, erasing shield, protractor, pencils, a file for sharpening the pencils, ink, pens and penholder and the necessary drawing and tracing paper. As these supplies are purchased in large quantities, the cost to the company is comparatively small. The boys are expected to provide their own drawing instruments, which, because of the large number of sets required, are comparatively inexpensive. A splendid set may be secured for \$4.00 and very satisfactory sets can be obtained as low as \$2.50.

Each school is provided with a small vertical engine and a light engine lathe, not necessarily new or up-to-date, which is used in connection with the drawing and problem course. Any number of practical problems may be based on the gearing, pulleys, etc., of the lathe, and the principles of steam distribution and valve setting are taught in connection with the engine. A combination stereopticon and reflection or opaque projection lantern has been purchased by the railroad company and is used in connection with lectures given. The testing laboratories, machinery and equipment, especially at the larger shops, afford exceptional opportunities for occasional practical demonstrations in connection with the class work.

Appreciation of Opportunity

The apprentices generally have displayed considerable interest in the work of the school and the efforts which are being made to improve their opportunities. This is clearly shown in a number of ways, especially by the earnestness with which the greater number of them are following up the drawing and problem courses. At several shops the writer called at the school during the noon hour, after the boys had eaten their lunch, and almost invariably, several of them would be found working on problems, looking up references, asking questions of the instructor or talking the work over among

themselves. Some of the boys have completed their apprentice course since the school was inaugurated, but realizing the opportunity which was being placed before them, they have enrolled in the evening classes and are continuing their studies in that way.

While only two or three of the schools have been in operation for as long as two years, a number of practical advantages have become evident. With the greater opportunities that are being offered a better class of boys is being secured. Formerly it was difficult to keep up the full quota of apprentices at most of the shops. Now there is a waiting list for some of the trades at several shops and apprentices are being secured for trades formerly without them. The apprentices take a greater interest in their work in the shop, and because of the principles learned in connection with their educational work are better able to understand the instructions given to them and to carry them out intelligently. The apprentice schools give promise of becoming a permanent boon both to those instructed and to the company. The former advance more rapidly and their earning power is thus increased. The latter have less spoiled work to charge to the loss account and have greater surety of obtaining a steady and skilled labor supply.

APPRENTICESHIP SYSTEM AT THE BALDWIN LOCOMOTIVE WORKS, PHILADELPHIA

BY N. W. SAMPLE,
Superintendent of Apprentices.

On the first day of January, 1901, the Baldwin Locomotive Works re-established a system of indentured apprenticeship which had fallen into disuse for over twenty-five years on a basis adapted to existing social and business conditions. The plan adopted met with general favor both among the employees and the public, a large number taking advantage of the opportunity became indentured the first year.

In order that the undertaking should have proper supervision, and to conserve the best interests of all concerned, the work was placed in charge of one man specially appointed. By this method it was possible to maintain uniformity of discipline and shop regulation in the different departments and to properly direct and supervise the instruction of the apprentices.

Description of System

Apprentices are taken in three classes. The first class includes boys seventeen years of age who have had a good common school education and who bind themselves by indenture, with the consent of parent or guardian, to serve four years, to be regular in attendance at their work, to obey all orders given them by foremen or others in authority, to recognize the supervision of the firm over their conduct out of as well as in the shops, and to attend such night schools during the first three years of their apprenticeship as will teach them in the first year elementary algebra and geometry and in the remaining years the rudiments of mechanical drawing.

The second class is similar to the first, but includes boys eighteen years old who have had a high school or college preparatory school education, and who bind themselves, with the consent of parents or guardian, to serve three years. This boy is obligated to attend night school the first two years of his apprenticeship for

instruction in mechanical drawing, unless he has already had sufficient instruction in that work.

The third class indenture is in the form of an agreement made with persons over twenty-one years of age who are graduates of colleges, technical schools or scientific institutions and who desire to secure instruction in practical shop work.

There is no school maintained at the works by the firm for its apprentices, no clubs, guilds or assemblies of any kind, paternalism being avoided wherever possible. The indentures in the first and second classes provide for attendance at the public schools, although a large percentage attend the night sessions of the scientific institutions, of which there are a number in the city. While a knowledge of higher mathematics and mechanical drawing is desirable and necessary and the attainment of proficiency in these branches is provided for, the vocational education of the apprentice is, however, most to be desired, if a class of good all-round mechanics is to be the result of the system.

All applications for employment under the system are made to the superintendent of apprentices, who has general charge and decides as to the acceptability of the applicant. The individual is required to make formal application in his own handwriting on a blank form provided for the purpose, stating what trade he wishes to learn, his age, school attendance, branches of study pursued, name of parents or guardian and residence. If the applicant is found to be physically able, and of good moral character, he is accepted on thirty days' probation, and if at the end of that time his conduct and service have been satisfactory he is indentured and paid a fixed wage per hour, increasing each year. If he completes the full term of his apprenticeship faithfully and well a bonus of one hundred and twenty-five dollars is paid to first-class and one hundred dollars to second-class boys.

Apprentices in the first and second classes are not permitted to work at the same process more than three months, or in one shop or department more than one year. Apprentices in the third class have change of occupation in the department to which they are assigned at any time they may desire by making application to the foreman. They are changed from one department to another every six months. When an apprentice has been indentured and assigned to a department the foreman in charge is furnished a blank form

on which is kept a complete record of the apprentice's conduct and service. This record is sent with the boy, to the foreman of the next department to which he may be transferred. The last period of one year or six months of each apprenticeship is spent in the erecting shop. His record is here completed and is filed with the original indenture when the term of service has expired.

Each sub-foreman or contractor has a number of boys and is held responsible for their vocational training while under his supervision. The discipline, however, remains with the foreman of the department, subject to appeal, in exceptional cases, to the head of the apprentices' department, whose duty it is to see that all indentured obligations are strictly observed, that changes of occupation and changes from one department to another are regularly made, that the apprentice attends school regularly and is given abundant opportunity to acquire a thorough knowledge of his trade.

School attendance is obligatory. A satisfactory excuse must be given for non-attendance. The attendance of the apprentices at the night sessions of the public and other schools has been remarkably good considering that the younger boys, less physically and mentally able, have been at work for ten hours. The attendance of those registered at the public schools in the session of 1907-08 was 84 per cent and of those registered at the scientific institutions 89 per cent, which is about the average of past years.

Results

The system as adopted in its practical application has worked out upon the whole quite satisfactorily. The apprentices come from all parts of the country, in fact, from all over the world, and it could, therefore, not be expected that all those who complete their terms should remain as journeymen in the employ of the works. It is a fact, however, that on the 1st of January, 1908, three years after the first indentured apprentice completed his term, there were employed over two hundred graduated first-class all-round mechanics capable of assignment to any shop work, and of this number fifty occupied places of responsibility as heads of departments, foremen, assistant foremen, contractors and leading workmen. It is no longer necessary to go outside of the works for any talent desired.

TRADE TEACHING UNDER THE AUSPICES OF THE TYPOGRAPHICAL UNION

BY W. B. PRESCOTT,

Secretary, International Typographical Union Commission on Supplemental
Trade Education, Chicago.

A number of things—all commonplace enough in the industrial world—moved the International Typographical Union to establish trade or technical education as a feature of its work. Its long and fruitless agitation to preserve some semblance of a real apprenticeship system taught it that the education of apprentices was no longer possible in the average printing office. The shops were becoming specialized, and hence of necessity graduated specialists. For employing printers to say they would thoroughly “teach” a boy the trade was largely a figure of speech; with few exceptions they could not if they would, as they lacked the facilities. The boy would be turned over to a foreman or superintendent, who is always harassed with demands that he reduce the cost of production, and who in turn is ever urging those under him to greater effort or devising plans to meet the insistent demand for an increased output.

In these circumstances it is not surprising that the foreman’s chief desire is not to teach the boy the trade, but to discover how he can be used most profitably. If the boy shows special aptness for some simple operation, his “apprenticeship” too often consists in doing that one thing. If he acquires a general knowledge of the trade, it is as best he may by the rule of thumb, for woe betide the journeyman who puts on his time ticket “Thirty minutes consumed in showing Johnny the how and why on the Smith job.” If fortunate, this warm-hearted fellow would be warned that he was there to produce the goods and not to show others how to do it. If not so fortunate, and he persisted in taking a real interest in the boy at his side, he would be laid off because his ticket didn’t show the results desired. This system has been producing so-called specialists, and some are inclined to say it is all right in an age of specialists, as they point to this lawyer or that physician or financier who has had unbounded success by following a specialty in his profession.

They forget that the physician is first well-grounded in the principles and practice of medicine, and the attorney in the principles of law, before selecting their specialties. That general knowledge is of great assistance to them. The workman trained in the manner just described may be a specialist at his trade, but it is because that one operation is the extent of his knowledge of his vocation. In the highly specialized trades the dread dead line, or age limit, is placed at an early year, and precarious employment is the rule. Not being transferable from one class of work to another, this kind of "specialist" is the victim of the greatest blight that can come athwart a wage-earner's life—unsteady employment. While the old apprenticeship system was decaying the quality of the printed page was improving. The improvement is due in great measure to the influence of commercial artists who design work to the last detail, which the artisan copies with more or less fidelity. This precludes even the most capable compositors exercising their ingenuity or skill, thereby reducing them to the grade of mere copyists, which is fatal to the development of originality or mental growth.

Another motive that actuated the union to take up trade teaching was a desire to influence in some degree the use of the new-found leisure of its members. The strike incident to the establishment of the eight-hour workday had not ended when the organization appointed a commission to formulate some scheme whereby its members and apprentices could obtain a better knowledge of the trade than is possible in the offices. The commission organized last December. Its problem was to devise a plan of education that would be acceptable to the nearly 50,000 members of the International Typographical Union distributed among about 700 local unions. It must have an educational scheme with a message for the best printer in the metropolis as well as the tyro in the "jerkwater" town. It was at first suggested that something be done along the lines of university extension work and the establishment of plants for school purposes in printing centers. This scheme was rejected, partly on account of the great expense attached thereto and partly because some of those paying for the educational system and perhaps needing its assistance most—those residing in small towns or in remote districts—would not be able to take advantage of it.

The "Inland Printer," the craft's leading trade journal, had conducted a technical school a number of years under the auspices of

the union. It had been a success financially, but its promoters had long been dissatisfied with the character of instruction imparted. Following the lines of typographical education generally, its standard of excellence was a matter of personal taste. If one instructor said "This is a good job," and another dissented from that dictum, there might be many words and some heat, but no informing, enlightening information reached the students. Convinced that there must be reasons to justify good typography, the promoters of the Inland Printer School determined to ascertain what they were, and remedy the defect common to trade educational efforts. They went to the art schools and schools of design, and on investigation found that they were teaching the principles which are the basis of good typography. It might be mentioned parenthetically that some of the art school people scoffed at the idea that what they were teaching had aught to do with so common a thing as printing; that art could have aught to do with what they deemed purely mechanical operations was not comprehended by them. The Inland Printer School then began to teach craftsmanship scientifically—to expound the principles of design and of color harmony.

About the time the union's commission was appointed it had been suggested that this system of instruction could be reduced to a correspondence course. Satisfied that the instruction was what was needed, the commission saw its way out of the dilemma born of the necessity for reaching the poorest and most backward printer as well as the best-paid men working in finely-equipped offices. As a commercial venture this course of thirty-seven lessons would cost from \$50 to \$60, which would deter many from taking it. The commission was anxious that no taint of profit should attach to its scheme—that it should have but the one purpose of advancing the interests of the students.

To that end it proposed that the Inland Printer School sell the instruction for approximately cost price. The union on its part undertook to do all the advertising and to give a rebate of \$5 to each student who pursued the course to the end with ordinary diligence and intelligence. This was acceded to by the school company, and the price of the course was set at \$20, which includes outfit, etc., valued at \$5, and the right of a student to seek advice from the experts of the school on any technical problem that may arise while he remains at the trade. The union looks on this

as a contribution to trade efficiency, and the only restriction imposed is that students shall be compositors, the course being open to apprentice or journeyman, unionist or non-unionist. In this shape the scheme was presented to the craft. Many local unions supplemented the work of the International Union by incurring expense in promoting the course, and adding a bonus to the rebate granted by the parent organization, while some at present offer special inducements to apprentices within their jurisdiction. Though employers concede the undertaking to be a magnificent effort to meet a pressing need, few of them as yet have done anything to aid in spreading a knowledge of the course. This is especially noticeable in the case of some employers who are known for their loud lamentations about the dearth of capable workmen.

The system is known as the International Typographical Union Course in Printing, and six months after its inception has about 400 pupils enrolled, including some of the most expert craftsmen on this continent and a few from the British Isles and Australia. The unanimous verdict of the students is that the course possesses all the merit and value claimed for it. One who is known the world over for the excellence of his work and the quality of his essays on typography, declares it to be of the best and cheapest information he ever secured. Another student—the highest-paid compositor in his home city—says he learned more about some phases of craft work in two months than he had acquired in sixteen years in the office.

The methods of instruction pursued are responsible for this. The aim of the course is to teach the principles underlying good typography. On the theory that the real tools of the decorative printer are letters, the student is required to do freehand lettering. This has some commercial value, for there is a steadily growing demand for hand-lettering in high-class printing. These lessons are in the course for their cultural value, however. The best manner of knowing the beauty and forcefulness of letters is to make them. When the student has acquired that knowledge he finds it a great help in using letters most effectively, which is the object of his craft. Many compositors objected that they could not do what is technically known as lettering, as when at school they had never had an aptitude for drawing. They are told that lettering is not art but craftsmanship, and that any one who can write can learn

to letter. In this and other ways they are encouraged, and after perseverance they make progress at a rate that amazes them and at first astonished the instructors. The commission had the work of students examined critically by instructors of the Art Institute of Chicago. Their report was that the class of printers made more rapid and satisfactory progress than did art classes. This unexpected proficiency was ascribed to several causes. The most rational explanation is that printers, having been dealing with letters all their mature days had acquired a wealth of sub-conscious knowledge concerning them which flowered and found expression as soon as they became acquainted with the tools of the letterer. The course does not impart new wisdom so much as it shows students a way to use talents they already possess, but of the possession of which they are ignorant.

The same is true of the principles of design. The successful compositor has been expounding those principles unconsciously. The average worker at the case—the man who sometimes does exceedingly well and on other occasions fails miserably—gets on or off the track of true art principles by accident, and in his ignorance wonders why he cannot “hit it off” on every job. The course shows these men of varying degrees of native ability as well as those without any artistic sense the laws that govern good typography. After following the lessons they know thoroughly what is meant by proportion, shape, harmony, balance and measure. They not only learn how to do their work correctly but *why* it is correct. Seized of this information, the compositor reduces the cost of production materially and adds immeasurably to the art value of his product, which ultimately means more printing, better prices and higher wages.

At present the hand of the designer is seen in much printing. Usually he is an outsider who knows little of the limitations that beset the worker in type metal. Intent on developing the artistic side of his design, he in his ignorance often sets the compositor impossible problems to solve. This results in loss in rearranging the design or a botched job, which is wasteful and injurious to the craft. Where the designing and composition are co-ordinated in one person these wasteful conflicts are obviated. Where the worker has a thorough understanding of the design and a sympathy with it from beginning to end more desirable results are sure to be attained.

With even advanced and progressive compositors color harmony is often regarded as a matter of taste. The course treats this subject in a scientific manner, and at the conclusion of this group of lessons the student, besides absorbing much other information, has made a chart which is an accurate authority on the harmonies, contrasts and complements of all the colors used in printing.

After a thorough drilling in these underlying principles, students are required to expound them by actual work in all the principal varieties of display composition, such as title pages, letter-heads, business cards of all kinds, advertisements, etc., under the supervision of the instructors.

The new features in typographical education embraced in the course are what the art schools have which can be utilized by compositors. Though these lessons are written by printers for printers, and contain a valuable education in themselves, the great benefit of the course is derived from the advice and criticism of the instruction department. Under the arrangement between the Inland Printer School and the commission it is provided that the instruction department must be kept at the highest point of efficiency. Circumstances may compel an increase in the tuition fee or the union may be required to spend more money, but the instruction must be the best possible. In furtherance of this desire, an earnest effort is made to get close to the students. They are requested to keep pads at their elbows and jot down anything which seems to interfere with their progress as students or in the workroom. Any student forwarding one of these slips is sure of promptly receiving the best advice which the instructors can give. Each exercise sheet sent in by a student is gone over carefully and in detail by an instructor, who indicates the faults in a colored pencil. The sheet is then returned to the student, together with a letter of advice showing why the student was at fault and how to correct the blemish. No pains or expense are spared to help the backward student—he is the especial care of the commission. Illustrative of this, I cite the case of one "slow" student who received a letter which, if paid for at the rates ruling with the technical press would have cost \$10. The recipient thought it worth many times that amount.

The International Typographical Union is recognized among economists as the typical American labor organization. It has been included in the general denunciation of trade unions for being op-

posed to technical education. Frankly, it is opposed to many of the schemes being fostered under the cloak of trade education. It is opposed to educational efforts that are more intent on making money for their promoters than on benefiting the scholars. It is also opposed to schools that graduate inferior workmen, as its members know the fate of such unfortunates, and those who induce men to go into the industrial battle poorly equipped not merely wreck human lives but swell the ranks of criminals.

The typographical union also holds it to be folly to erect special machinery to entice men or boys to take up trades that are already overcrowded. The usual and natural avenues of the trade open the way for a sufficiency of beginners. Some employers want to see hosts of unemployed at all times, so that the grinding of the faces of the poor may be made easier. Of course the unions are opposed to that, as are all those who delight in seeing the relative standard of living of the masses maintained and improved. In short, the union contends—and it knows—that there is no dearth of mechanics and artisans, but the great army of them are not as skilful as is desirable. This is not their fault, nor that of employers, but of industrialism. In helping these to better things, the union believes it is subserving the interests of the individual, the craft and society, and that is why the union printers of the United States and Canada are spending approximately \$15,000 a year to advance the interests of supplemental trade education. It is admitted that exceptionally apt persons manage to achieve success under existing apprenticeship systems. But the world is not made up of exceptional people, and the industry would fail utterly if only the naturally fitted were to enroll among its followers. Therefore, trade educational schemes should be developed with the idea of aiding the average man, who seems to be an object of scorn in some quarters. But the union's commission believes that what helps him will result in the greatest good to society. It may be profitable to a few to have the land swarming with half-baked mechanics, but it is neither patriotic nor humane.

THE POSITION OF LABOR UNIONS REGARDING INDUSTRIAL EDUCATION

BY JOHN GOLDEN,

President United Textile Workers of America, Fall River, Mass.

The impression seems to prevail in many quarters that organized labor, as represented by the labor unions, is opposed to the movement for higher education along industrial lines. It is my purpose to show that such is not the case by any means, but that the labor unions in very many instances have lent their aid and moral support to this movement.

I am frank enough to admit that organized labor has on some occasions opposed the so-called "trade school," when these schools were run with no other object in view but to reap profit from those whom they were supposed to teach. Another potent reason why this kind of school was looked upon with disfavor by the trade unionist was because the pupils who had been taught, or were being taught, in such institutions were used against the unions when they became involved in a dispute with the employers. Under similar conditions the labor unions always will oppose such a movement. Why, I ask, should they not do so? A skilled trade in the hands of any workman is the most valuable asset he possesses. It is from that source he must build up a home for himself and his wife, and upon that he solely depends to feed, clothe and educate his little children. Why, I ask, should he not jealously guard what is perhaps the only valuable asset he can ever hope to own in this world? But when this attitude of the organized working man is construed so as to mean that he is opposed to the whole movement of industrial education, then society does him an injustice.

I had the honor to serve on a commission appointed by Governor William L. Douglas, of Massachusetts, about four years ago, to investigate the needs of industrial education in Massachusetts. We held public hearings in every city of any size in the state. Men and women in all walks of life gave their views and opinions on the subject. Among those testifying was every labor man of any note holding an official position. In every instance we found that, while these

men were opposed to the trade schools which were run for commercial profit, they were all in favor of opening up better facilities for acquiring industrial and technical education, and in many instances offered their services in promoting the movement.

While I was satisfied that we had wiped out this misapprehension as to the attitude of organized labor in Massachusetts, I know it existed more or less in many other parts of the country. Consequently, I determined to bring the matter before the convention of the American Federation of Labor. In the meantime I suggested to the National Society for the Promotion of Industrial Education that they select a representative to attend the convention and expound the principles upon which the above named society was founded. Mr. C. R. Richards, of New York, was appointed. He made a splendid address, which was listened to very attentively by the delegates present, nearly four hundred in number.

The committee on education discussed my resolution and made the following report: "After an exhaustive, impartial discussion, your committee decided to record itself in favor of the best opportunities for the most complete industrial and technical education obtainable for prospective applicants for admission into the skilled crafts of this country, particularly as to the full possibilities of such crafts, to the end that such applicants be fitted, not only for all usual requirements, but also for the highest supervisory duties, responsibilities, and rewards. And your committee recommends that the executive council give this subject its early and deep consideration, examining established and proposed industrial school system, so that it may be in a position to inform the American Federation of Labor what, in the council's opinion, would be the wisest course for organized labor to pursue in connection therewith." The report of the committee was unanimously concurred in. I would like to ask whether this looks like antagonism to the industrial educational movement.

We have three splendid textile schools in Massachusetts, located in Lowell, New Bedford and Fall River, which have been in operation for many years. They are supported partly by the state and partly by the municipality in which they are situated. Several of the officials of the textile unions in each city are members of the board of management, and have done their share in making these schools a success. While I could give many more examples of the

same kind as to the fallacy of believing that the labor unions are opposed to industrial education, I think the above ought to suffice.

In conclusion, let me say that in my opinion the position of organized labor should be clearly defined upon this subject. I shall at all times, so far as I am individually concerned, oppose the trade school which attempts to turn out a full-fledged bricklayer, carpenter or machinist, in a few months time and for a certain price. It will not alone lower the standard of any industry, but is detrimental to the boy's own interest. He who is given such an education, making of him a "half-baked" journeyman, as it were, by a process which converts the school into what is commonly known as a "scab hatchery" is not a needed acquisition to the ranks of labor. On the other hand, I shall always be glad to co-operate in any movement which tends to place our industries on a higher plane, to open up better and more opportunities for your boy and my boy to acquire an industrial and technical education which will enable him to fight life's battles better equipped than we were. In such a movement I feel safe in saying organized labor is with you heart and soul.

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